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ABSTRACT

Demographic developments in Western Europe are examined in this report. It can be used by secondary and college level teachers in preparing lessons or by students themselves. There are three major parts. The first part, "Past Trends," focuses on the increase in European population. The size of that population and its growth over a long period are considered. Attention is also paid to its spatial distribution, and then to changes in the birth and death rates over time. Part II examines the population structure of Western Europe. The most important change in the age distribution of Western European countries has been the increase of the proportion of the elderly caused by a deceleration in the population growth, in contrast to developing countries where this deceleration has not yet occurred. Also examined in this section are two other aspects of the population structure: the dependency ratio and the activity rate (the ratio of the labor force to the total population). Part III deals with "Recent and Future Developments" in population trends. Attention is paid to the trends of birth and death rates from 1950 to 1977, as well as to the underlying factors influencing these rates. How recent levels of births and deaths might affect the development of population in the future is also discussed. (RM)

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ON EUROPEAN POPULATION,

DEMOGRAPHIC DEVELOPMENTS

PART A

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ON EUROPEAN POPULATION, DEMOCRAPHIC DEVELOPMENTS

PART A

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ON EUROPEAN POPULATION, DEMOGRAPHIC DEVELOPMENTS

Introduction to the theme

Every day a mass of information becomes available about the conditions under which people live all over the world. Newspapers, radio and television transmit reports and the issue is discussed during geography and social science lessons in school.

The density of the population of an area is an important factor influencing the quality of living conditions in an area. Population size changes continuously and the trends are watched carefully by local, regional and national authorities. Monitoring of these changes is undertaken by the population units of national, regional or local government offices. In addition, the national government takes censuses, usually every five or ten years. The children who are born, the elderly who die, and those who leave or enter an area are carefully documented.

A government is responsible for the welfare of the population. Not only has there to be sufficient food, electricity and public transport. There is also the need to provide for schools, houses, roads, recreation facilities etc. etc. But for the provision to be sufficient requires a quick reaction to changes in the structure of the population. If the number of children increases because of a decrease of infant mortality,then a need to provide schools and teachers arises. If the number decreases as a result of less births, then schools have to be closed down and teachers are made redundant. If the number of elderly people increases on account of a decline in mortality rates then the government has to be mindful of making the necessary provisions for that group in time.

In densely peopled areas population increase means, especially in combination with a rise of prosperity, a rapidly growing pressure on the environment. In areas with a decreasing number of people as a result of emigration, the quality of living deteriorates because a smaller population cannot make viable the provision of the whole range of facilities. In its turn the decline in the quality of living conditions promotes an increase in the number of emigrants.

The development of technology is an important factor to promote the welfare of the population. The pessimistic prediction of Malthus are a good example of this. He thought that population would outgrow the means of subsistence. Malthus, in the early years of the 19th. century, could not foresee the coming technological and social revolution. The former, among other things, allowed a far higher agrarian production per surface-unit. But how far can technological development be stretched? What is the limit which the environment can bear? These are questions to which it is difficult to give definite answers. In any case, governments must watch closely and react early to population changes.

To govern thus means to foresee. In the countries of Western Europe young people have the right to vote, in some cases as early as 18 years of age. They thus have the opportunity to participate in thinking and decision-making, about such issues as the way in which the government can maintain a certain quality of living in an area, not only in Europe but through that in the rest of the world.

But it is at the same time important to realize that individual behaviour in such aspects as family planning, and through that the consumption of goods, services and space, is an important influence on government decision-making.

In the following sections demographic developments in Western Europe will be examined.[1] Attention is paid to past trends, to structural aspects, as well as to recent and future trends, that is to say until the year 2000 and after.

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1) The countries of The Council of Europe (+Finland) are sometimes referred to as Western Europe.

Didactic remarks

This information package of European demographic developments is of flexible construction with regards to its use.
It can be used by the teacher in preparing lessons or units about demographic developments in Western Europe, but it can also be used by the students themselves to study demographic aspects. Each text has attached visual material, two items per page A-4.The total number of the text of part I: 47, part II: 46, part III: 47.
The visual material can be studied along with the text. If necessary for didactic reasons transparencies or slides of the visual material can be made. The quality of the material allows this way of doing. It is also possible to put the texts on an audio-tape (cassette) and to use the visual material in connection with this as an integrated audio-visual package. (Source naming sufficient.)
The text is thus constructed and written in such a way that it can be used used for reading as well as for listening. Lenght of the spoken text of part I: 18', part II: 20', part III: 21'.
The way in which the material will be used might very well be determined by the pre-knowledge of the students, the place and space allotted to the topic in the curriculum.
Since in the countries of the Council of Europe the curricula do differ so much, the study of demographic aspects is rahter new and the didactic approaches as such vary from country to country, the authors have sought for an optimal way to present these important information.
The authors will be glad to receive any type of feedback on the nature and content of the information package.

ON EUROPEAN POPULATION, DEMOGRAPHIC DEVELOPMENTS

Part 1

Past trends

1. Introduction picture

2. This section focuses on the increase in European population. The size of that population and its growth over a long period will be considered first. Next we will briefly pay attention to its spatial distribution; and then to changes in the birth and death rates over time, the so-called demographic transition.

Size and growth

3. At the present time 4 milliard (4 thousand million) people live on earth. Of this number, about 12 %, or about 475 million, live in that part of Europe which is shaded on the map.

4. At the beginning of this century, about 18 % of the world's population lived in this part of Europe. At its end, probably only about 8 % will inhabit this area. This in itself will be an ample 500 million people.

5. The European share of the world's population has thus gradually become less. Although since 1750 the growth of European population has continued at a rate averaging 7 °/oo per annum over the period, its rate of growth has been less than that of other continents. This means therefore that the population of the other continents has grown faster than that of Europe.

6. The world's population is increasing at about 20 °/oo per annum, a greater rate than ever before achieved. Long ago, the growth rate was only 1 °/oo. The beginning of the rise in the growth rate came after 1600.

7. In recent times the growth has become so enormous that we can speak of a population explosion. The continents in which the developing countries are situated have experienced the most explosive population growth.

8. Here we see that the share of Europe in that population explosion has been rather small.

9. At the beginning of the nineteenth century, a marked acceleration in the growth of Europe's population occurred. During that century it reached 7 °/oo per annum, a promillage over the world average for that time, though one which is now below the world average.

10. At the end of the 19th century the share of Europe in the increase of the world's population was around 25 %.

11. If we add Russia to Europe then the European share was more than this, about one third. But even this addition does not do justice to the extent of the increase.

12. We must also remember that millions of Europeans left Europe to build a new life elsewhere. If we also take into account the population growth in these areas of European settlement, then people of European origin accounted for a little over half the increase in the world's population.

13. At a rough estimate, 60 million Europeans emigrated between 1820 and 1940, particularly to North America. Since the Second World War Europe has lost its character as an emigration continent. Net emigration has decreased considerably. The rate of growth of European population has not increased in consequence, however, but has remained at about 7 ^{o}/oo per annum.

14. Population growth is the outcome of natural increase and/or an excess of immigration over emigration.
If net emigration decreases while the population growth remains constant, then the natural growth must have decreased.

15. Such declines in the natural growth are especially interesting when we think of developing countries. Generally a rapid population increase has a restraining influence on economic progress.

16. Thus in many developing countries a rapid population growth is characteristically linked with poverty.

17. In Europe on the contrary the rapid population growth has been associated with a growth in prosperity. Population growth and economic development have apparently in this case interacted favourably.

18. Here two factors have played a prominent part. In the first place there were outside Europe large areas available for settlement. The massive emigration which took place lessened population pressure on Europe. In the second place, Europe, in this same period, controlled a large part of the world economy.

19. Of the 400 million Europeans living in the countries of the Council of Europe the majority inhabit the urbanized-industrialized centre-area. In this densely populated area interrelated problems arise. We can think among others of:

20. industrial pollution,

21. the decline in housing conditions and

22. in the general quality of the environment.

23. In contrast with this densely populated centre-area the sparsely populated areas such as Central France and

24. Scandinavia, are clearly distinguishable.

The demographic transition

25. We will now examine the major influences on European population growth. This we can interpret from the birth and death rates. It is not possible to give one and the same description for all countries, for the demographic characteristics of different countries have varied. On the other hand, neither is it necessary to investigate every country separately to achieve an overall view. For a number of countries have shown more or less the same pattern of birth and death rates.

26. The U.K.,the first industrialized country in Europe, exerted an important influence in many different fields up to the First World War. Therefore, first we will look at a model of demographic development as it appeared in the U.K.

27. In this model of demographic transition we notice that at the point of departure, about 1750, birth- and death rates are close to each other; then they separate and end up joining together again on a much lower level about 1930. Thus a change has taken place from a high birth and death rate to a low birth and death rate level. The period between 1750 and 1930 forms the time in which this demographic transition occurred.

28. The decrease of the death rate began about 1750. This decrease was brought about by a decrease of infectious diseases, such as typhus, small-pox and diphtheria.

29. The impact of these diseases became less severe. It is thought that increased prosperity together with improved nutrition helped to give the population greater resistance to disease. In this context, the agrarian revolution played an important role, in that the production of more and better plants helped to improve nutrition.

30. In addition, improvements in hygiene in the nineteenth century played an important part in the decline in death rates. Developments in urban water supply and in the provision of internal washing facilities lessened the risk of infection through water pollution. Other important measures were the laying down of drainage systems and the paving of streets.

31. Finally,the progress of medical science has contributed to a constant decline in the death rate. But it was not until the 1930's that this factor became significant.

32. After having looked at the causes of changeing death rates, we will now examine the factors affecting changes in the birth rate. The earliest trend was a slight increase, then for many decades the birth rate remained at a high level. This has since been followed by a rapid decline, one much faster than the death rate, in fact.

33. The small initial increase was connected with the decline of the death rate and the increase of the employment under the influence of the Industrial Revolution. More marriages were contracted, because people did not have to wait so long for a job and thus could marry at an earlier age.

34. In Western Europe, the custom continued of a couple not marrying until the man and woman had saved sufficient money, and could provide their own living accomodation and themselves support their family.

35. We have already noted that the birth rate remained on a high level for many years. Families were large in size. The causes can all be subsumed under the same heading: children acted as a cheap means of social insurance.

36. When in the course of the nineteenth century the death rate further declined, and the sense of personal security increased, when child labour was forbidden and compulsory education was introduced, the incentive to bring large numbers of children into the world was lost. Moreover, striking changes in the socio-economic structure had their effect. The growth of factory production led to increasing demands for skilled labour.

This exposed the need for better education. Better education made possible an increased social mobility. At the same time, educational costs increased. This and other factors led to the diffusion of birth control techniques,first among the higher income groups, then spreading lower down the social scale.

37. The rapid decline in the birth rate had to await the time when the great mass of the working classes achieved a degree of material prosperity, and took advantage of better educational opportunities to achieve social mobility.

38. It is noticeable that in the 1930's birth and death rates approached each other closely, at a lower level than hitherto.

39. When we subtract the death rate from the birth rate we have the natural increase in the population. In the U.K. the demographic transition began with a natural increase of around 5 ^{o}/oo, a normal promillage for the pre-industrial period. By the 1920's the natural increase had returned to this level. We could therefore say that at this time the transition was over. During the transition the natural increase achieved a maximum of 15 ^{o}/oo, three times the level at the start and at the finish.

40. A number of countries have passed a transition closely resembling that of the U.K. These countries are Norway, Sweden, Finland, Denmark, Belgium, the Federal Republic of Germany, Luxembourg, Switzerland and Austria.

41. We now will have a look at the course of the demographic transition in France.

42. We notice here that the natural increase until about 1950 was around 2 to 3 ^{o}/oo and that it was only after 1950 that this figure reached 6 to 7 ^{o}/oo. Thus in France the courses of birth and death rates have been totally different from those of the U.K. The most characteristic difference is, that both birth and death rate have declined at the same time. The early decline in the birth rate is connected with certain characteristics of French culture. The Revolution of 1789 strengthened the trend towards a decline in the birth rate because people became increasingly prosperous and social mobility was fostered. The small natural increase led to an ageing of the population. Only after the Second World War did the French government promote a more active population policy, increasing the natural rate of growth.

43. In addition, we must mention the countries of southern Europe: Portugal Spain, Italy and Greece, which have experienced a development with many points in common. Italy is something of an exception, in that only the southern part has comparable characteristics with the other Mediterranean countries, the northern area being more akin to more northern parts of Europe.

44. The example of Spain illustrates that the countries of southern Europe in 1870 maintained high birth and death rates.Until 1930 the birth rate was decreasing, but it still remained high. The death rate then declined more quickly and a large natural increase was responsible for a rapid overall population increase. The stage in which the U.K. found itself in 1930 was only reached by the southern European countries in 1970. The main cause of this lag was industrial underdevelopment and the related social frameworks.

45. Finally, we will concentrate on two countries with very characteristic population developments, namely Ireland and the Netherlands.

46. In agrarian Ireland, a rapid population increase was brought to a halt in the 1840's by famine, caused by the decimation of the staple food supply as a result of potato blight. This resulted in massive emigration, which in turn slowed down the natural increase in the population, because many of the emigrants were younger people. Of those who remained, many married later, and a far greater proportion than was normal for Europe did not marry at all.

The situation in Ireland was similar to that of France but the causes lying behind it were totally different.

47. In the Netherlands in 1930 the natural increase was twice as high as in the U.K. This was the consequence of a relatively high birth rate and a relatively low death rate, as compared with England. The low death rate was brought about by good medical facilities and a high standard of hygiene. The high birth rate was in large part a result of the restraining influence of the church, preventing it falling through birth control measures.

In outlining the course of the demographic transition in different European countries we have concentrated on the most important factors in the population development of Western Europe.

Part II - Structural aspects.

1. This section examines the population structure of Western Europe. Age distribution forms an important part of this structure, and reflects changes in births, deaths and migration. It is a mirror of the demographic past. Age distribution, in its turn, influences the course of birth, death and migration rates and is thus a determinant of the future size and structure of the population. Also are examined in this section two other aspects of the population structure: the dependency ratio and the activity rate. Both are important for present-day and future society. But first we will have a close look to the concept of age distribution.

The age distribution.

2. The age distribution of a population reflects the structure of the population in respect of age and sex. Diagrammatically it can be shown in the form of two bar-graphs, one for the age distribution of males, and the other for the age distribution of females. Here we see two elements expressed in terms of sex and age distribution.

3. In this visual image both diagrams are now tilted and joined together.

4. Both the bar-graphs are now incorporated in one figure. The traditional term for such a diagram is a population pyramid, because nearly always the shape approximated to a pyramid. Nowadays we prefer to speak of a population diagram.

5. In the population diagram the ages are classified on the vertical axis by year of birth or by five-year group. In the left part of the population diagram the male and on the right part the female population is represented.

6. On the horizontal axis the size of each age-band in absolute numbers or in percentage of the total population, is given.
   In order now to clarify the nature of different shapes of these diagrams, the age distribution of the populations of Iceland, Switzerland and Sweden are compared.

7. In the case of a rapid [illegible]owing population, as in Iceland, the diagram has a pyramidal shape. The younger age-bands are the largest. In the upper part the size of the bands decreases on account of death.

8. If the rate of growth of the population decreases, the pyramid shape disappears and an inverted "v" or an onion shape can come about. In 1971 the age distribution in Switzerland clearly showed the inverted "v"-shape.

9. In 1971 the onion shape was most clearly demonstrated by the age distribution of Sweden.

10. In addition to countries, population diagrams can also be constructed for provinces, parishes, and towns and cities. Here we see for instance the population diagram of West Berlin in 1950. The small share of the group from 15 to 35 of age was above all a consequence of the migration to the Federal Republic of Germany.
We could also make a population diagram of people living in an arbitrary street. In general the chance of shapes deviating increases with smaller population numbers. If, for example, an old people's home exists in a particular street, the diagram might assume the shape of a toadstool.

11. In this pie-graph, the population is divided in three age-groups. This division is chosen in such a way that the three age-groups more or less coincide with that part of the population not yet employed, that part participating in the production-process (i.e. the employed population) and that part which has retired. The given division is a Western European average.
In this drawing we see also the share of the three age-groups in the total population of Iceland, Switzerland and Sweden in comparison with the average share for Western Europe. In the Icelandic pyramid the share of the three groups deviates the most from this average. In Switzerland it more or less coincides the European average, while Sweden, with its onion shaped population diagram, has the lowest percentage of youthful and the highest percentage of aged people of the three countries.

12. If we compare the age distribution of Iceland, Switzerland and Sweden in 1970 with that of 1950, then we see that the age-group of people aged 65 and over has increased, in relative terms.

13. Everywhere in Europe the percentage elderly people seemed to have increased between 1950 and 1970 with 2.6% of the population on average in that age-band. This relative increase of the older age-groups is called demographic ageing or just greying. The diagram shows us that the pace of the ageing in the three countries varies. In Finland and Ireland the share of the older people has hardly increased; in Sweden, Austria, Denmark and Greece on the contrary it has increased by over 3%. In the Netherlands the share of people aged 65 years and over increased from 7.7% in 1950 to 10.2% in 1970, an absolute increase of more than half a million people.

14. In this diagram the degree of ageing in 1970 is given. The population of Italy, notwithstanding the rapid ageing between 1950 and 1970, has not aged so much overall as the population of France and England. That is because in most Western European countries the ageing began much earlier, viz. about 1870. Then, in those countries the birth rate began to decline. It is also this decrease which has contributed to the ageingof the population and not just the decrease of the death rate. The decrease of the death rate has had less influence on the share of the older people in the total of the population. It is a fact of course that through decrease of the death rate the population size has increased, with an absolute increase in the number of the elderly. In the Netherlands the decline of the birth rate set in much later than 1870. That is why in 1970 in the Netherlands the process of ageing was much less advanced in comparison with other countries of Western Europe.

15. When we compare the population diagrams of England and Wales in 1871 (shaded) and 1971 with those of the Netherlands in 1869 and 1969 we see that the percentage of old people in the population of England and Wales in these hundred years has increased by 8.4%. But in the Netherlands the share of old people has only increased by 4.6% over that same period.

16. From this table it is quite clear that in most of the continents the percentage of old people has increased. Only in Africa and in South-Asia, has it decreased. The greatest rate of ageing is to be found in Europe. The differences between the industrial countries and the developing countries are mainly caused by differences in the birth rate. A high birth rate is associated with a high proportion of young persons in the total population and therefore the proportion of older people is small. A low birth rate is associated with a large proportion of older people and in consequence there are fewer young people.

The sex ratio.

17. In population diagrams we not only deal with the different age-groups but also the proportions of men and women by age-groups. The ratio of the number males to females is called the sex ratio.

18. By convention, the sex ratio is the ratio between the number of men and women expressed as the number of men per 100 women. The sex ratio affects directly the number of births, marriages and deaths. The ratio between the number of men and women is mostly given in connection with the total population of a country.

19. If the sex ratio indicates a number over 100, then we have a condition of male surplus, while a number under 100 indicates a female surplus.

20. In this table we can see that the sex ratio in 1972 varied considerably as between different European countries. It ranged from 88 in Austria, to nearly 101 in Ireland. In all Western European countries mentioned in the table, except for Ireland, there is thus a surplus of women.

21. It is quite clear from this table that in the countries outside Europe a male surplus is less uncommon. In general the sex ratio in developing countries is higher than in the industrialised countries. This is connected with differences in age distribution.

22. We will now turn to the population diagrams of Switzerland, the Netherlands and the Federal Republic of Germany. Surpluses of men and women are shaded. We see that in the age-bands up to about 40 there is a male surplus. This can be explained largely in terms of differences in births. Of every 100 children born, there are 49 girls and 51 boys.

23. In the older age-group the female surplus is brought about by higher death rates among men in middle age and old age. Women reach a higher age on average.

24. We can see that in the Federal Republic of Germany the female surplus in the older age-groups is larger than those of Switzerland and the Netherlands. What might be the reason? We have already proposed that present age structures reflect demographic processes in the past.

25. We can explain this therefore with the help of a more detailed population diagram of the Federal Republic of Germany in 1970, in which each age year is identified separately. In the margins the years of birth are noted of those making up the different year-bands. Most striking are the two large notches on both sides of the population diagram, which are caused by two World Wars. These wars have significantly influenced the course of the death and birth rates in Europe. The lowest notch is caused by a strong decline of the birth rate during the Second World War. Countless men lived for long periods separated from their families and many did not return. Moreover, many married couples postponed having children, prefering to wait for better days. After the chaos caused by the war was over the so-called "baby boom", caused by the postponed births became apparent. In the upper part of the diagram the proportion of men is considerably smaller. The cause is not only the larger natural death rate of men as compared with women, but above all is the result of the First World War.

26. In this diagram the trend of the sex ratios between the population of the Federal Republic of Germany is shown. The influence of the two World Wars on these ratios is equally dramatic.

The dependency ratio.

27. We turn again to the distribution of a population in the three broad age-bands viz. 0-19, 20-64 and 65+, classified according to social and economic conditions.

28. Each of the above-mentioned groups needs particular facilities, respectively education,

29. employment,

30. care for the elderly.

31. The division is not arbitrary. The younger group, under 20 years of age, together with the elderly one of people of 65 and over, represent the large majority of the economically inactive population. They are for the most part either not yet at work or have retired. The group between 20 and 65 represents the economically active population. The ratio between these population groups is indicated as the dependency ratio. The dependency ratio is thus the ratio of the economically inactive population to the economically active or working population.

32. In the Netherlands the dependency ratio was nearly 85 in 1970. This means that for every 100 people in the productive age range, there were 85 in the non-productive.

33. For Europe as a whole in 1970, the average ratio was nearly 82. The high dependency ratio in the Netherlands, as compared with the rest of Europe, was above all caused by the relatively large share of young people.

34. If we compare the age distribution of Europe with that of Latin America, then it appears that young people in Latin America make up more than half the population, whereas the proportion in Europe is only one third. The most striking difference appears with the elderly group, this being in Europe three times as large as in Latin America. The elderly thus form a much larger part of the economically inactive population in Europe than in Latin America. The very large ratio of young people in Latin America results in a dependency ratio much higher than in Europe, viz. 123. This means that the economically inactive age-groups are nearly 25% larger than the economically active.

35. The dependency ratio is an important consideration for any country, because it influences the relative size of the working population. By that we mean not only people at work, but also people seeking employment. A small working population means that proportionally a small part of the population has to support a large part, which is a heavy burden for the economy.

The activity rate.

36. After having examined the concepts age distribution and dependency ratio, we now turn our attention to the activity rate. By activity rate we mean the ratio of the labour force to the total population.

37. As an example we will use the activity rate for the Netherlands. The number 35.9 signifies that 35.9% of the total Dutch population in 1971 is considered as part of the labour force.

38. In this table the activity rate of the population of several Western European countries is ranked. In Ireland, the Netherlands and Spain it is relatively low, while in Switzerland, England and Wales, and Finland it is relatively high.

39. If we compare these figures with those of the dependency ratios in the same countries, then we notice that in general a high dependency ratio runs parallel with a low activity rate. The more people who belong proportionally to the unproductive age-groups, the smaller the labour force is likely to be.

40. This is not an invariable rule, however, because the activity rate of a population is not determined exclusively by the dependency ratio. It also depends on such factors as mean length of schooling, the number of women at work, and the age of retirement of the majority of the people.
Though the largest part of the labour force comes into the productive age range, there are of course also younger people of under 20 years of age and elderly of 65 and over who also have a job. On the other hand there are people in the productive age-group whom we cannot count in the labour force, such as students, housewives and people who have retired early.

41. In this bar-graph the figures of the countries with the highest and lowest activity rates in 1970 are grouped viz. Switzerland, England and Wales, Finland and Ireland, the Netherlands and Spain. The explanation of the low activity rates in Ireland, the Netherlands and Spain lies above all in the limited number of women at work. In these countries fewer married women are occupied outside their homes. The number of women at work in Switzerland, England and Wales and Finland, the same countries with a high activity rate of the population as a whole, is high.

We can also calculate the activity rate for men and women separately. This indicates that the differences in activity rates for women are higher than those for men.

42. Apart from the labour productivity the activity rate has an influence on the gross national product per inhabitant. On the map at the left we see that the Netherlands has a relatively low gross national product per inhabitant. If we calculate the gross national product per person of the labour force than the picture changes. The relatively low gross national product per inhabitant in the Netherlands is in fact mainly caused by the small number of women at work.

Age distribution and future development.

43. As already mentioned, the age distribution has an influence on future population development. So in the Netherlands, for example, the size of the younger age-groups is proportionately large. Most of the younger group will marry in the years to come and have children. And even if they have relatively few children the Netherlands will continue to experience a population growth. The end of the growth comes into view only after the year 2000.

44. In such a country as the Federal Republic of Germany, where the youthful age-group is relatively much smaller, the birth rate from 1972 has been lower than the death rate. If we count the 1972 population in both countries as 100, then by the year 2000 there will be an increase to 116 in the Netherlands and a decrease to 92 in the Federal Republic of Germany.

45. In this section we have focused on the age distribution aspect of the population structure. We have seen that the age distribution is a mirror of the demographic past. The most important change in the age distribution of Western European countries has been the increase of the proportion of the elderly caused by a deceleration in the population growth, in contrast to developing countries, where this deceleration has not occurred as yet.
The age distribution means also a distribution related to sex and this is expressed by the so-called sex ratio.
The socio-economic consequences of the age distribution have been explained in terms of the dependency ratio and the activity rate.
Finally attention has been paid to the influence of the age distribution on population development.

Part III - Recent and future developments

1. Finally, part III will deal with recent and future population trends. First, attention will be paid to the trends of birth and death rates from 1950 to 1977, as well as to the underlying factors influencing these rates. Then, we will discuss the question of how the recent levels of births and deaths might affect the development of population in the future.

Trends in birth and death rates between 1950 and 1977

2. This diagram shows the trends in birth and death rates for Western Europe. Taking the entire period, the birth rate declined, though not at a regular rate. From 1955 to 1964 there appeared to be a moderate, though regular increase. Thereafter, the birth rate went down rapidly. The death rate stabilised. Apart from minor fluctuations it remained at a constant level.
   As the birth rate declined, birth rates and death rates therefore converged.

3. Birth rates and death rates as used in part II and part III are gross figures. We repeat the definitions given in those sections.
   The crude birth rate indicates the total number of births per 1000 persons of the entire population in a given year.
   The crude death rate indicates the number of deaths per 1000 persons of the entire population in a given year.
   Gross figures give only a global insight into demographic matters. This rude registration of crude birth rates and crude death rates can be refined by taking into account the age structure of the population (see for age structure, part II; for casual remarks on the influence of age structure on birth rates and death rates, nr. 43, 44).

4. A closer scruting of death rates.
   As for the population in general, death rates can also be calculated for separate ages or age-bands (for example, quinquennial age-bands). These rates are called age-specific death rates. According to the related table it appears that the age-specific death rate from age band 10-14 upwards steadily increases. The reason for this is the increased probability of dying at a higher age.

The exception is the relatively high probability of dying in infancy. Only people aged 55 and older have a higher age-specific death rate than children aged less than 1 year. Furthermore, as this table indicates, the death rate of women is below that of men.

5. It appears that in Western Europe the crude death rate has not changed much since 1950, while at the same time a change in age structure has taken place in such a way as to result in an ageing of the population. Thus, an increase in the death rate would be obvious. But there is another factor, or, strictly speaking, a complex of factors affecting the crude death rate. Some of these can be grouped as factors of social hygiene, such as the availability of drinkable water, sewerage, refuse disposal and the attitude to sanitation in general. Up to 1931, one could see the "kar van Boldoot" (the "perfume car") at De Jordaan, a popular neighbourhood in Amsterdam, collecting buckets full of nightsoil from the inhabitants.

6. It was only in the course of the 20th century that infectious diseases came under control. Cholera, for example, was a dreaded phenomenon in the Netherlands as late as the end of the 19th century.

7. There are, apart from reasons of social hygiene, medical circumstances that affect the crude death rate. The quality of medical services is therefore very important to the study of death rates.

8. The number of hospital beds per capita and of doctors per capita, as well as the amount of health insurance, constitute another group of factors.
   Since 1950, improvements in medicine and social hygiene have repelled death in such a way that ageing of the population has had no significant impact upon death rates. On the other hand, the influence of ageing on death rates does not reveal the full impact of improvements in medicine and social hygiene on the decline of mortality.

9. To show the full impact of social hygiene and medical factors on death rates, we need to introduce two new demographical concepts:
   life expectation (for children aged less than 1 year) and infantile mortality.
   - Life expectation (for children aged less than 1 year) will be defined as the average length of life for children aged less than 1 year.

- Infantile mortality will be defined as the number of deaths among children aged less than 1 year in the year under consideration.
- Life expectation is calculated by means of the prevailing probability of dying at a certain age. Decreasing probability of dying corresponds with increasing life expectation. So if the probability of dying decreases for children aged less than 1 year, which also means a decrease of infantile mortality, the expectation of life increases.

10. This diagram shows the course of infantile mortality and also the course of life expectation for children aged less than 1 year in Belgium, Spain, Sweden and Switzerland from 1950 to 1975. The diagram clearly shows the increase and decrease respectively of life expectation. The situation of these four countries corresponds with the Western European situation in general. We notice a sharp rise in the life expectation of children aged less than 1 year, especially between 1950 and 1960.
    This increase is concurrent with a decrease of infantile mortality. From 1970 onwards, the decline in infant mortality continues, while the life expectation hardly increases, due to ageing of population.

11. Improvements in the field of medicine and social hygiene were pushed to a higher level by a rising prosperity. But prosperity also has its negative effects on death rates. A change in lifestyle -too much drinking, eating, smoking- causes a sharp rise in the number of deaths due to so-called "prosperity diseases". Cancer, heart-attacks and vascular diseases are increasingly causes of death in people older than 45 years of age in almost all developed countries.
    Furthermore, traffic accidents and stress at work also lead to higher death rates.
    - In the Netherlands, for example, the probability of dying for persons aged 50 years increased between 1951/55 and 1971/75. Consequently, the life expectation of 50 years old persons decreased from 25.8 to 24.9, a decrease of almost a year.
    - Over the same period, however, the life expectation of women aged 50 years went up from 27.4 to 29.8, that is an increase of almost two and a half years.

12. As the crude death rate is a rough index of death, so is the crude birth rate a rough index of fertility of a population.
The birth rate is not only determined by the number of births among women aged 15-49 years, which we call fertility, but also by the percentage of women aged 15-49 years to the total population, and the percentage of married women between 15 and 50 years.

13. This diagram clearly shows the importance of the share of women, aged 15-49 years, in the total population. In this diagram, two areas A and B, with 10 millions of inhabitants each, are compared. The number of women aged 15-49 years, however, is different (3 millions and 2 millions respectively). Although the average number of children that each woman aged 15-49 years will have, viz. her fertility, is the same in both areas (100 children per 1000 women), the birth rate in A will be 30^{o}/oo as in B it is 20^{o}/oo.
    - Obviously the difference is caused by the fact that the number of women aged 15-49 years is much larger in A.

    The significance of the percentage of married women between 15 and 49 years of age is obvious, in that the great majority of children are born after the marriage of their parents.

14. Let us have another look at the course of births in Western Europe from 1950 to 1977. The question arises: what caused the increase of the birth rates up to 1964 and how can we explain the sudden decrease afterwards?

15. As for the increase of the birth rate in 1954/64, a very important factor was that after 1954 a greater percentage of the population married, and also at a younger age. The old Western European marriage pattern gradually declined.
More marriages mean more children and thus an increase in birth rates.

16. The rapid and continuing decrease of the birth rate after 1964 was, above all, determined by changes in age at marriage and in fertility.
After 1964, the situation of a relatively large percentage of the population entering into matrimony and also marrying relatively young came to an end. As a result, the birth rate decreased "by itself". For, no "extra" children were born and children of marriages contracted at a younger age were already born.
Another phenomenon was the decrease in fertility. Up to the early 1960s most families consisted of four or five members and even larger families than this were not considered "abnormal". At present, four in a family is considered as the most convenient structure and families with only one child or with no children at all are occurring more frequently.

We also find that the timing of having legitimate children is often postponed, or, that marrying itself is postponed until one wants to have a child (in which case, people enter into matrimony at an older age than in the early 1960s).

17. Why do people choose nowadays to have less children? It is hard to answer this question accurately. We can, however, mention some of the most important factors that have influenced this behaviour.
    - Because of improved contraceptives, there is no need to have more children than are strictly planned for.
    - More people are applying birth control techniques.
    - The possibility of women undertaking activities outside the household have increased enormously, due to progress in the emancipation of women.
    - Furthermore, money is spent in an increasing way for recreative purposes and for personal development of all family members.

18. To acquire further knowledge concerning the decrease of fertility in different countries, we use the total fertility rate. This figure is composed of the age- specific fertility rates in a given calendar year of women aged 15-49 years. In a way, this figure could be considered as the average size of a completed family. The total fertility rate has the advantage over the crude birth rate in that it is a genuine index of fertility, because it refers only to persons who are physically capable of producing children, viz. women aged 15-49 years.
    In addition, the influence of the age structure has been eliminated, so that the fertility in different countries can be compared more accurately.

19. This table reveals the total fertility rates of each country.
    As one can plainly see, there has been a sharp decrease of fertility: in five Western European countries the decrease was 40% or more.
    In the Netherlands, which used to have a relatively high fertility rate, the sharp decrease is striking. In the southern European countries as well as in Ireland the decrease clearly lags behind that of the western European countries.
    Now, we pose the question of what consequences the recent decrease of fertility could lead to for the Western European population in the future.

Development trends to 2000 and thereafter.

20. Whether the size of a population can decrease, increase, or remain at the same level in the future, can be deduced from the total fertility rate. If the population size remains stable, births and deaths are well balanced. Disappearing generations are replaced by appearing generations. That is why one may say that if a population is stationary (stable), then the fertility is at the level of reproduction.
At the present death rate, a total fertility of 2.11 is needed in order to bring birth and death into an equilibrium. Thus, a little more than two children per woman ought to be born to keep the fertility at reproduction level.

21. Let us consider again the total fertility rates of the western European countries in 1977. It appears that no less than thirteen out of eighteen countries had a total fertility rate below reproduction level (2.11). West-Germany was at the lowest level (1.41), much too low for a stationary population. Only in southern European countries and in Iceland and Ireland was fertility above the reproduction level. This is not to say that if a population has a total fertility rate that is below reproduction level, the population increase will immediately change into a population decrease. Accordingly, the table shows that most countries with a fertility rate below their reproduction level, still had a surplus of births over deaths. This is connected with the age structure in those countries (see part II, nr. 43).
But the time comes when the population begins to decrease and from then on, it is very difficult to achieve an increasing population size, also due to the population structure.

22. We cannot predict, however, how the fertility level will develop in future. In view of the facts determining fertility, as mentioned before, the expectation is that the fertility level will remain low. Let us look at two calculations ahead, for western European (in a narrower sense) and southern European countries.
The first prognosis assumes that from 1986 on the average number of children per woman will be two, i.e. a fertility that is slightly below the reproduction level, but above the fertility level that was characteristic of most countries in 1977.
The second prognosis assumes that from 1986 on, the average number of children will be 1.5, i.e. a fertility level that is far below the reproduction level and also below the fertility level in 1977.

Both calculations reveal an increase in population for the first decades to come. At the first calculation the population will increase till 2030 and considering the second one the population will decrease after 1990, though the population size will be larger in the year 2000 than it was in 1970. Calculations from this table show that 88% of the western European population in 1970 would equal the total population in 2030. In the southern European countries 98% of the total population in 1970 would equal the total population in 2030.

23. Until the year 2000 the population size will not suffer from a drastic decline as a consequence of a low fertility level. After 2000, consequences will be noticeable, especially in West-Germany, which of all western European countries had the lowest fertility rate in 1977. In 1975, the West German population almost reached 58 million. If fertility does not change, there will be 39 million West Germans left in 2030, that is 68% of the population in 1975, and only 22 million in 2070 (38% of the population size in 1975).
The decrease of the younger age groups, consequent upon low fertility, will lead to a rapid ageing of the population after 2000. The percentage of people aged 65 and older will increase from 15.8% in 2000 to 25.2% in 2040!

24. As far as the Netherlands is concerned, the "Centraal Bureau voor de Statistiek" (National Statistical Office) at The Hague has produced two calculations from a base-line in 1975. Alternative A starts from a "high" fertility assumption (viz. 1.9 children per woman, so this figure is still below the reproduction rate) while alternative B starts from a low fertility (1.5 children per woman).
In case of alternative A the population size increases to over 15 million in 2020, with a decrease in population afterwards.
In 2050 the population would be as large as in 1975.
In case of alternative B the maximum size of the population would be reached in the year 2000, viz. 14 million, whereupon a sharp decrease would set in. Already by 2050 the population size would be less than 10 million which is only 71% of the Dutch population in 1975.

25. In 2020, the population would have a much older age structure obviously, more in the case of alternative B than in that of alternative A.

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The ageing of the population does not involve an increase in the dependency ratio, as some are inclined to think. On the contrary, as this table reveals, the dependency ratio would decrease in alternative A as well as in B (see for dependency ratio, part II, nrs. 27 to 36).

26. This table shows clearly the possible shifting of age-bands. Based on the population development according to alternative B, two items are compared in the table, in absolute figures: the composition of age-bands (>20 and <65), and the active population band (aged 20-65) in 1975, 2000 and 2020. The years 1975 and 2020 have approximately the same population size. In 2020 the age-band 65 years and older would be twice as large as in 1975 (+1.162 millions), whereas the band aged less than 20 years would approximately be half as large as in 1975 (-2.209 millions). The change in the age structure can also be seen in the active population band. The population band aged 20-39 years would be larger in 2000 than it is in 1975, but in 2020, smaller than the same age-band in 1975.
The band aged 40-64 years would increase steadily throughout the entire period (see for labour force participation ratio, part II, nrs. 36 up to 43).

27. Whatever the actual population trends in Western Europe may be, it is a fact that in the near future the increase will maintain a slower pace than in the recent past, even if possible migrations are taken into account.
As far as the pressure on the environment is concerned, slackened growth is a positive trend, as is the decrease of the dependency ratio. A looming difficulty is that the expected ageing of the population will demand adaptations in many ways, for example, adaptations in housing, industrial production, and social welfare. Equally in the labour market there is already, for example, a surplus of teachers, and a shortage of help to elderly people. Furthermore, an older population might be less pliable mentally than a younger population, which could be a disadvantage when it comes to solving the difficult economical and technical problems which society has to cope with.

28. In the long run, the problem of a real decrease of the population will arise. There is little harm in a moderate decrease of population, but no nation would like to face total extinction. In most countries, a stationary population seems to be the most attractive perspective for the future. Many countries will need a considerable change to bring the low fertility as it exists at present back to reproduction level. As an example, the table reveals how the family structure would have to be altered to bring fertility back to reproduction level in West Germany, the country with the lowest fertility and with a birth deficit. To do this in West Germany, it would be needed that about half of the families with two children should have another child; that one in ten families should have four children; and that the number of families with one child, or without children, should be limited as much as possible.

29. The question is whether such a change can take place "spontanuously" or not. The chances are that governments will have to pursue a purposeful policy, a "population policy", to increase the number of births. Some of the steps a government could undertake are financial incentives to have larger families, or, to make it easier for women to combine household work and a job.
To pursue a population policy is not a simple matter, for not all the various effects of the policy can be estimated beforehand. That is why a stationary population should be considered as an ideal situation, that will never be attained completely. As a matter of fact, population will sometimes increase and sometimes decrease. In the long run, however, the population would be more or less the same in size and structure.

30. More than any other country, France is afraid of population decline. To a Frenchman, it is an unbearable thought that the French culture might possibly disappear. Furthermore, since the 18th century France has changed from the most to one of the least densely populated countries in Western Europe. The French government needs people to maintain the social-economic welfare of its vast empty spaces, the "désert français".
Again, since 1975 the French government has pursued an active policy to increase the number of births. West Germany, which is much more

densely populated, has not yet introduced such a policy. Even so, West Germany examines closely its own population trends, and the public has been informed of all the facts by newspapers, magazines, radio and television.

31. The Netherlands has just completed a period which was characterised by a relatively high fertility. That is why the present ability of the population to grow is such that an increase of fertility is undesirable. In order to keep the maximum population size at an acceptable level, fertility should be stabilised at reproduction level for the next two decades.
As mentioned before, the calculations of the "Centraal Bureau voor de Statistiek" (C.B.S., National Statistical Office), came to a maximum population size of a good 14 million (nr. 24, alternative B), to ample 15 million (nr. 24, alternative A) in the year 2000. According to the latest calculations however, there is a greater chance of surpassing the limit of 15 million than of remaining at 14.
This is not because of the fertility, which has lately increased, but of the inclusion of the migration surplus in calculations concerning population size. In the Netherlands, problems regarding population have not yet been determined by a shortage of people!

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ON EUROPEAN POPULATION,
DEMOGRAPHIC DEVELOPMENTS

PART B
VISUAL MATERIAL

Dr. Jan A. Verduin and Dr. Henriëtte S. Verduin-Muller

in co-operation with the doctoral students:
Ruud van Dongen, Marian Groenevelt, Henk van den Heuvel,
Ton Hoozemans, Auke de Jong, Liesbeth van Omme.

Drs. Th. C. M. van der Heijdt, maps and diagrams
G. H. Huygen, reprography.

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The resulting study on theory and methods is published by the Geographical Institute, State University, Utrecht.

The authors

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ON EUROPEAN POPULATION, DEMOGRAPHIC DEVELOPMENTS

PART B

VISUAL MATERIAL

See for the text matching the visual material 'On European Population, demographic developments', part A, Geographical Institute, State University, Utrecht, 1982.

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ON EUROPEAN POPULATION, DEMOGRAPHIC DEVELOPMENTS

PART I - PAST TRENDS

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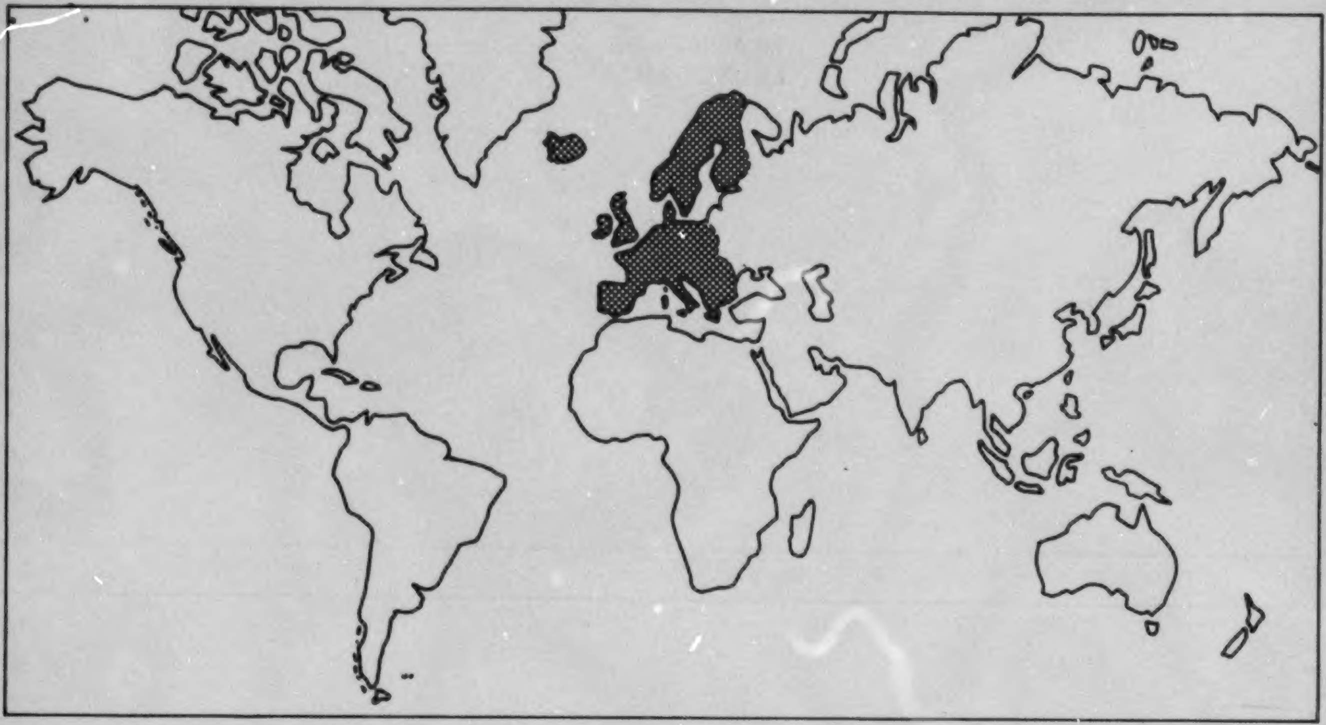
THE EUROPEAN POPULATION :

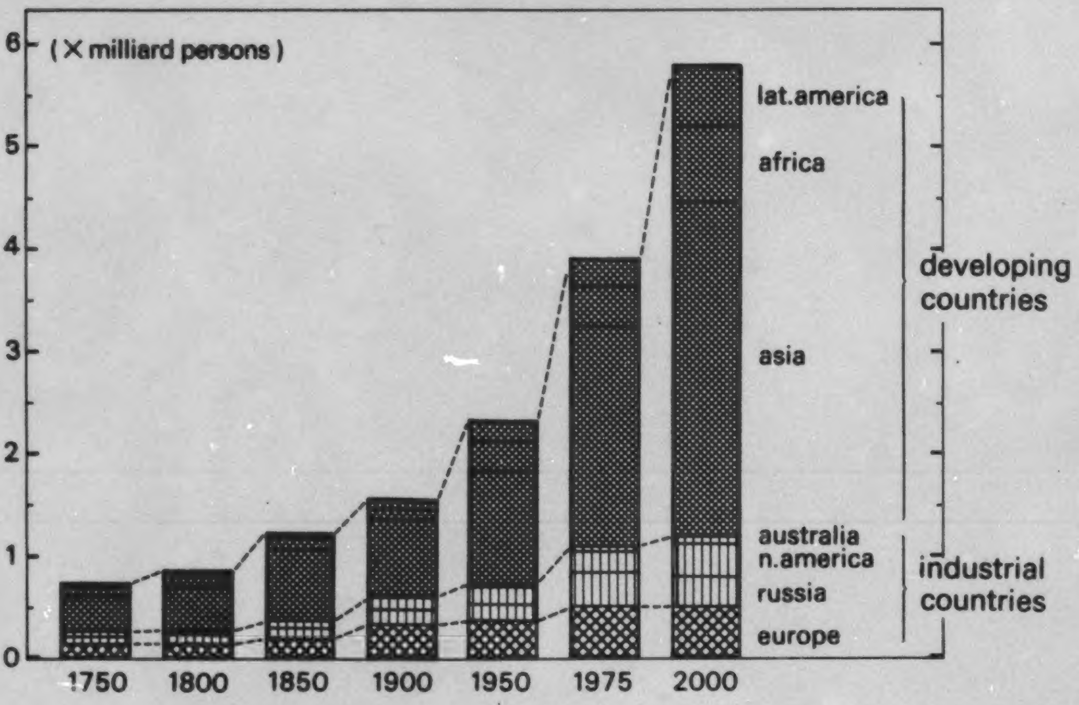
- SIZE AND GROWTH
- DISTRIBUTION
- DEMOGRAPHIC TRANSITION



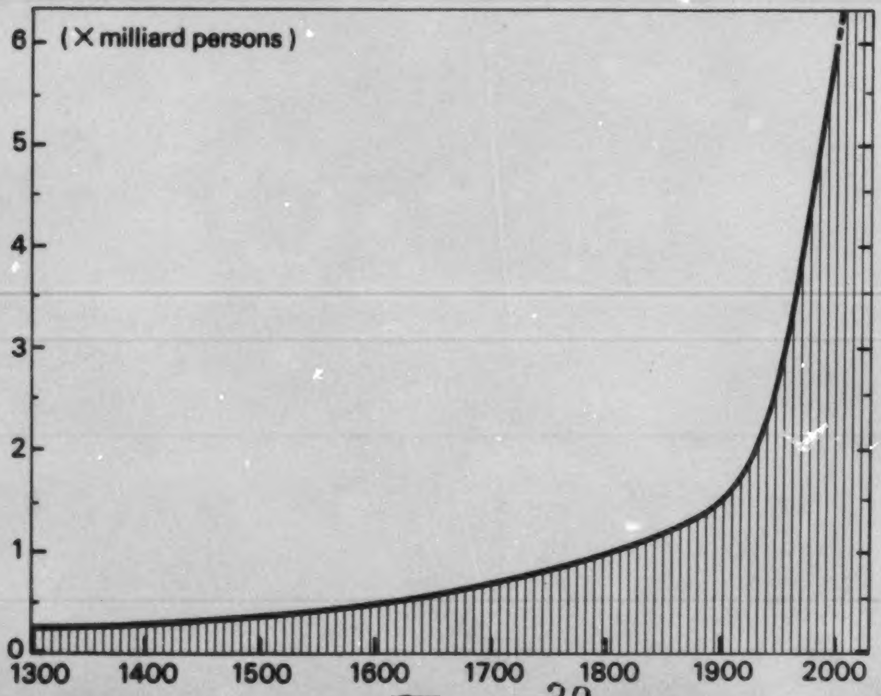
RELATION: WORLD POPULATION/EUROPEAN POPULATION

YEAR	WORLD	EUROPE (EXCL.RUSSIA)
1890	1.5 MILLIARD	300 MILLION (=18%)
1975	4.0 MILLIARD	475 MILLION (=12%)
2000	6.0 MILLIARD	500 MILLION (= 8%)

WORLD POPULATION: 1750 – 2000



GROWTH OF THE WORLD POPULATION : 1300 – 2000



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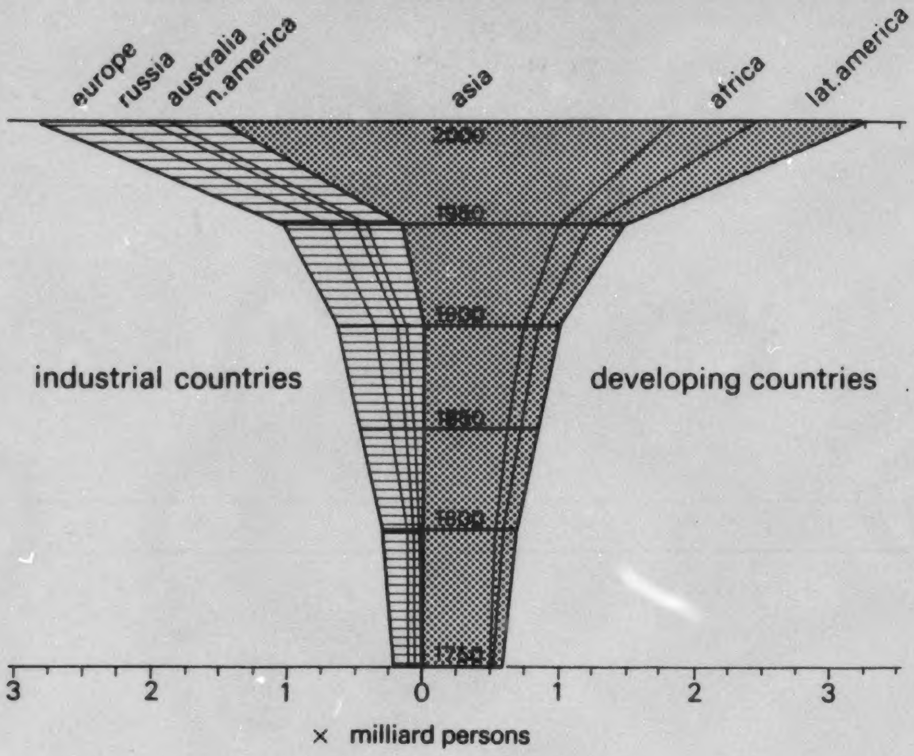
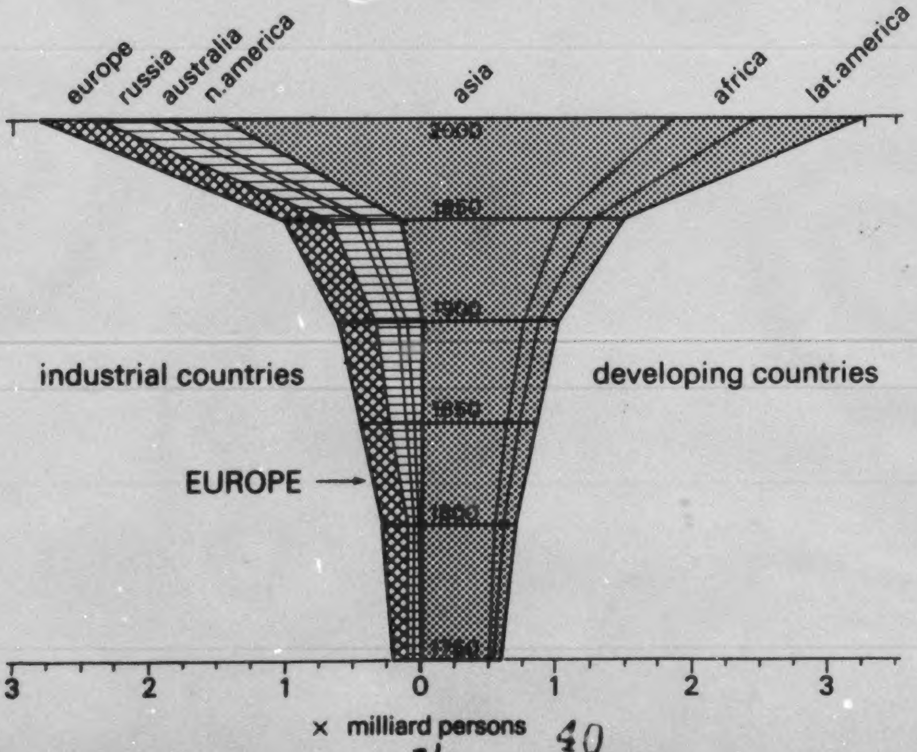
THE POPULATION EXPLOSION



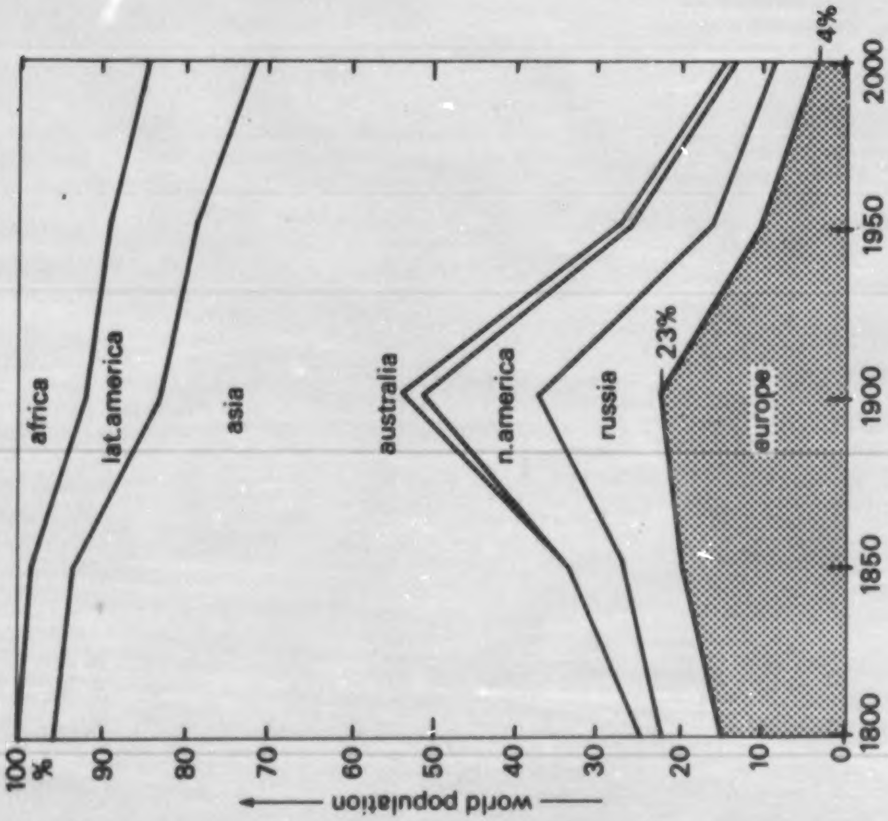
THE SHARE OF EUROPE IN THE POPULATION EXPLOSION



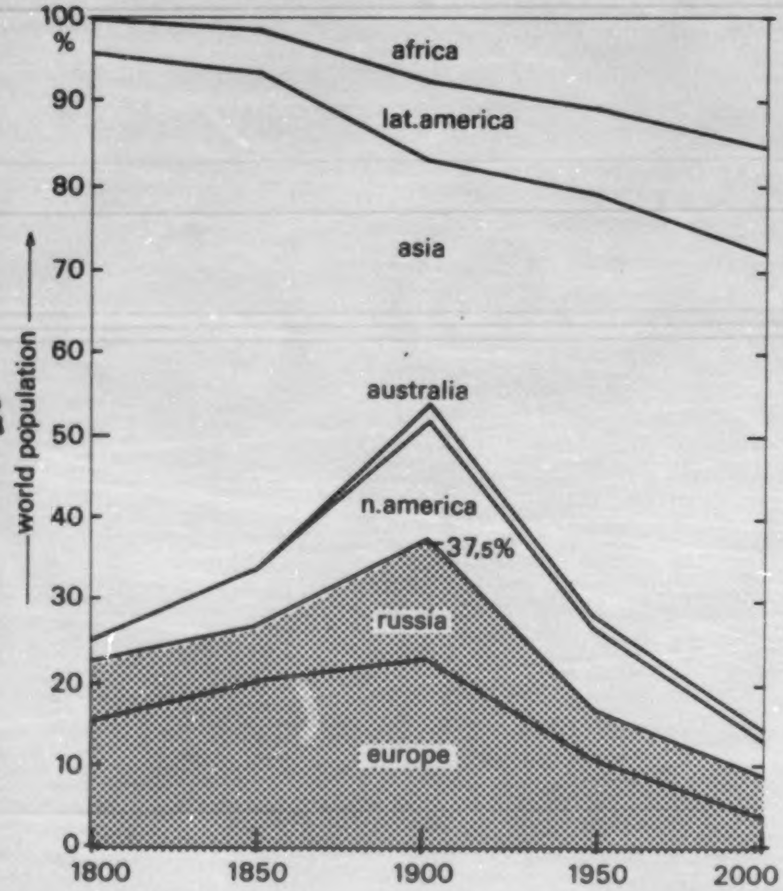
GROWTH OF WORLD POPULATION AND EUROPEAN POPULATION. AVERAGE 0/00 PER ANNUM :

YEAR	WORLD	EUROPE
1600	1 0/00	1 0/00
1850	5 0/00	7 0/00
1975	20 0/00	7 0/00

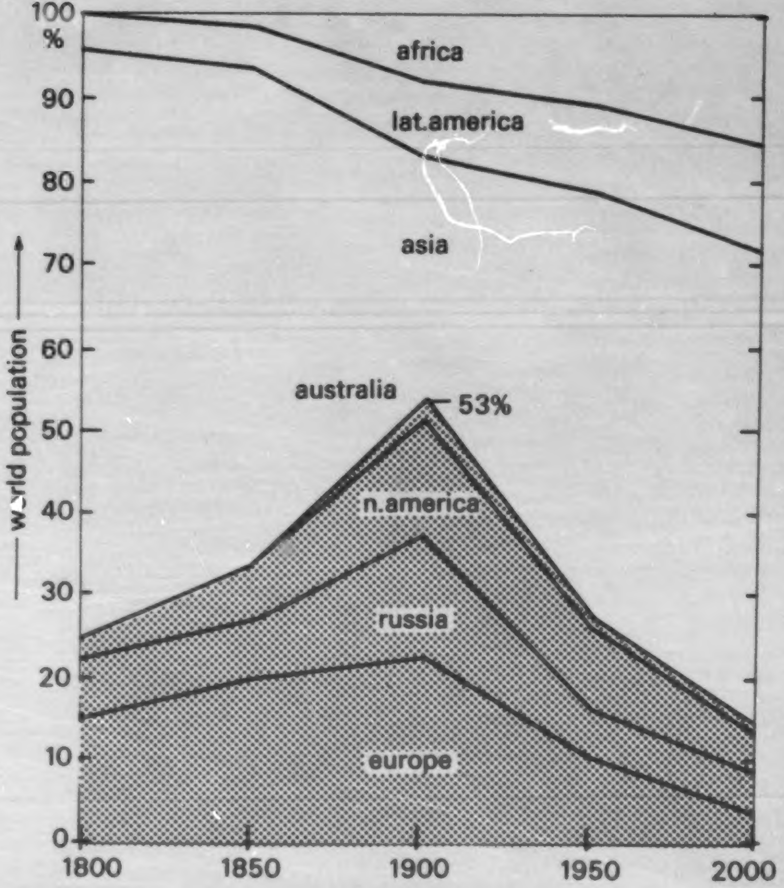
THE EUROPEAN SHARE OF THE WORLD'S POPULATION BETWEEN 1800 AND 2000



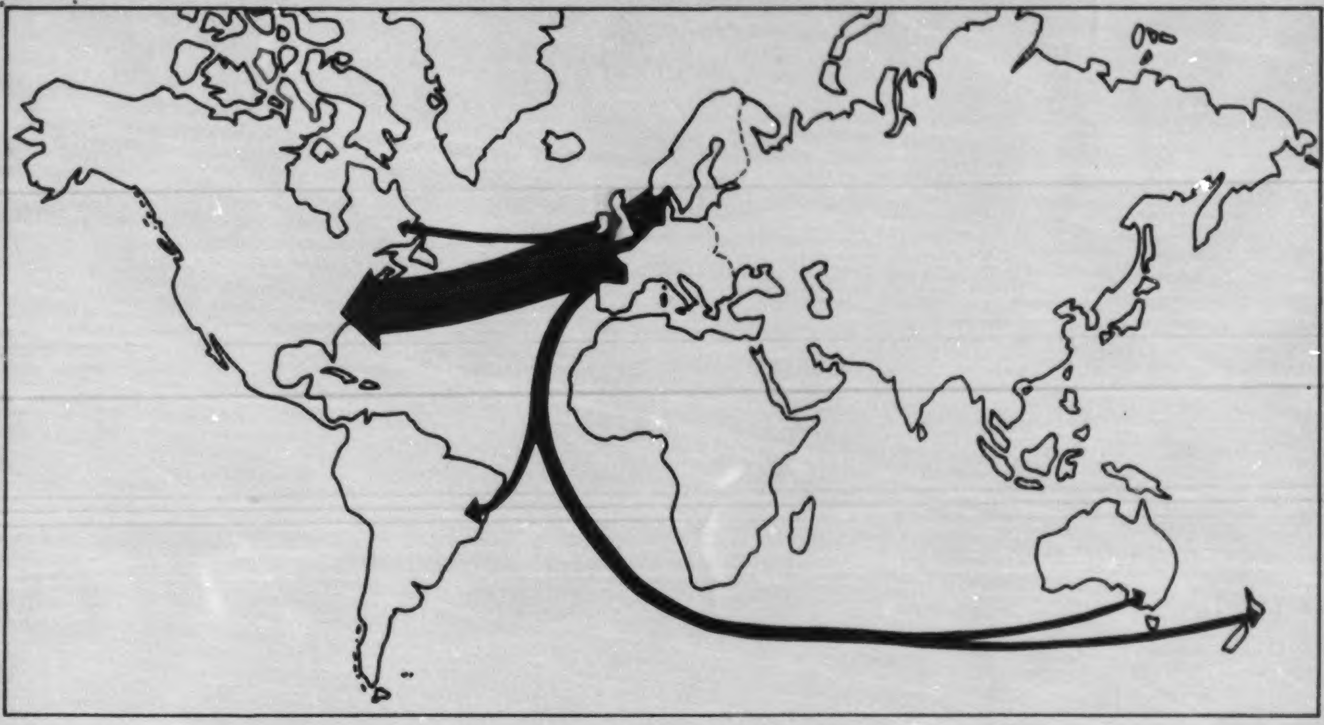
THE EUROPEAN SHARE OF THE WORLD's POPULATION BETWEEN 1800 AND 2000



THE EUROPEAN SHARE OF THE WORLD's POPULATION BETWEEN 1800 AND 2000



THE EUROPEAN EMIGRATION IN THE 19th AND THE FIRST HALF OF THE 20th CENTURY



POPULATION INCREASE:

NATURAL INCREASE ± MIGRATION BALANCE

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EUROPE : FAST NATURAL POPULATION GROWTH NEVERTHELESS ECONOMIC DEVELOPMENT. REASONS :

- EMIGRATION ON A LARGE SCALE POSSIBLE
- EUROPE CONTROLLED WORLD ECONOMY

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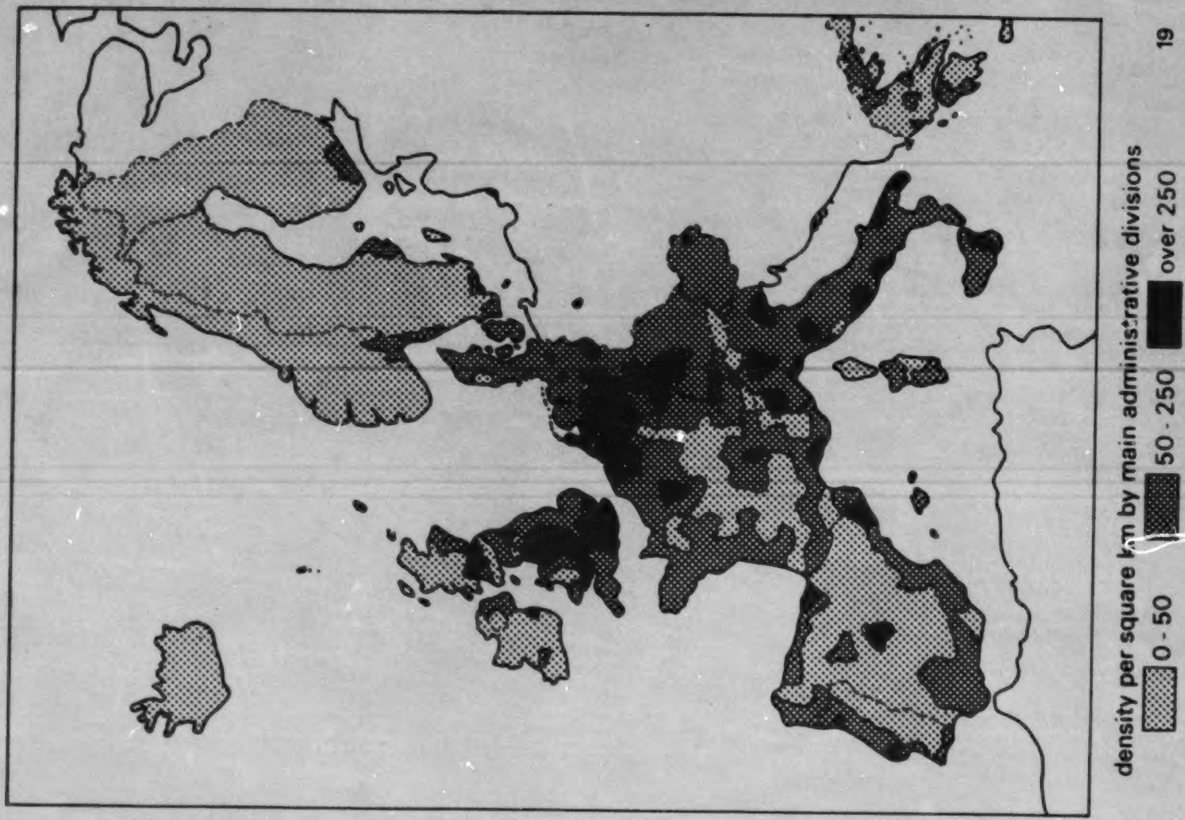
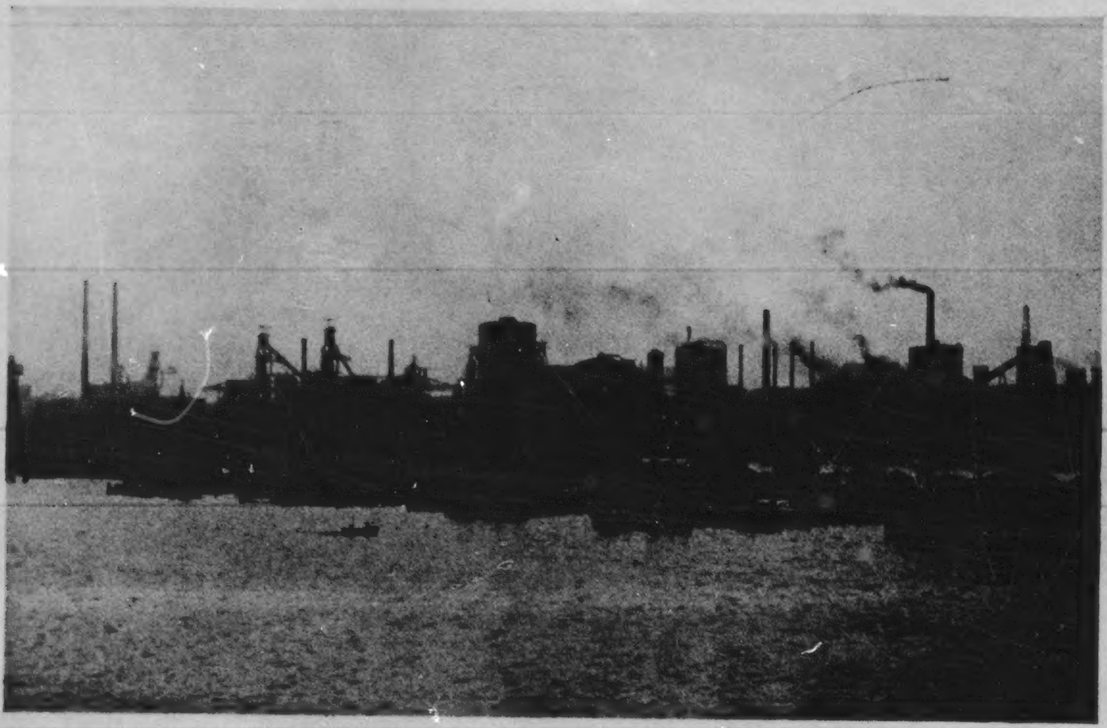
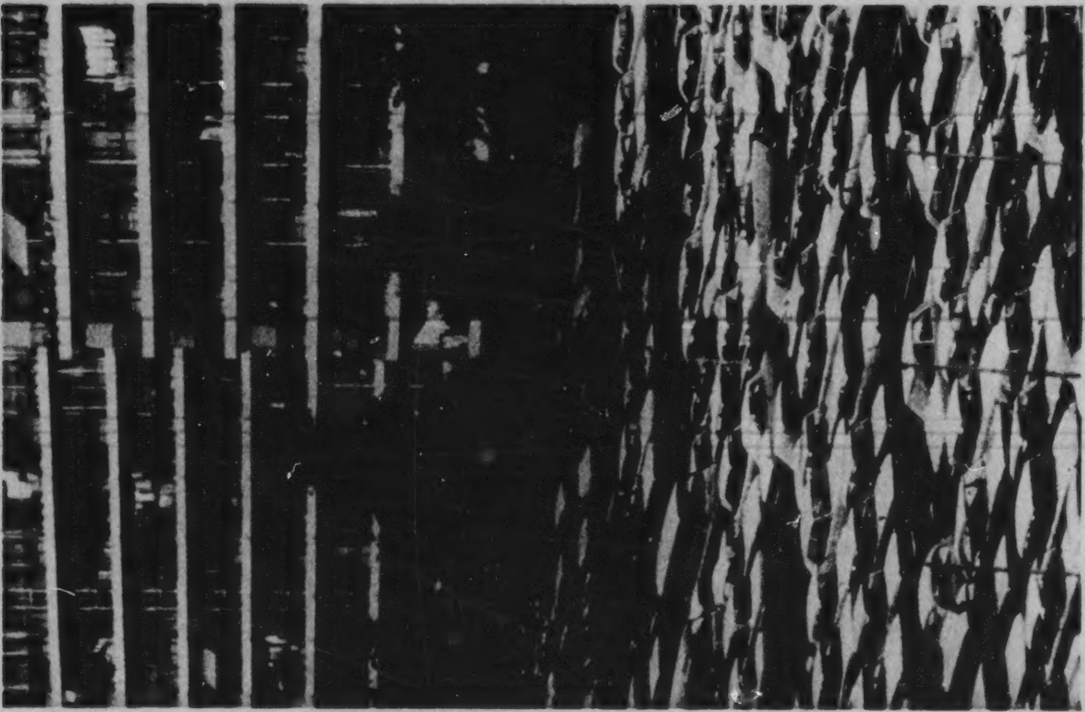
DENSITY OF POPULATION IN 1970







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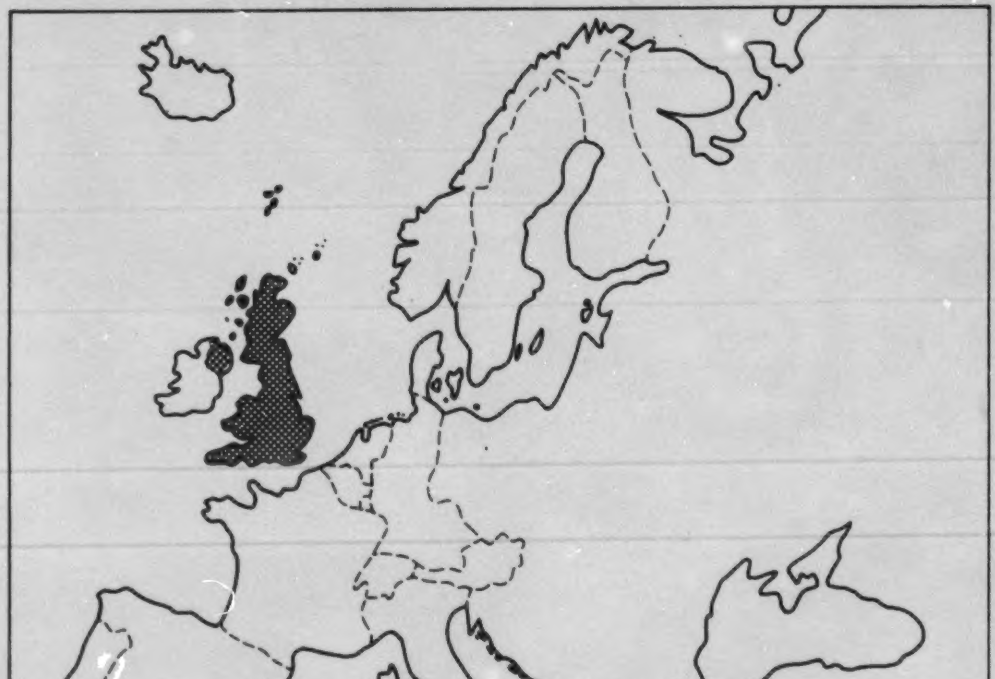
BIRTH/DEATH RATE → POPULATION GROWTH

POPULATION GROWTH → VARIES, BUT
GLOBAL VIEW IS POSSIBLE



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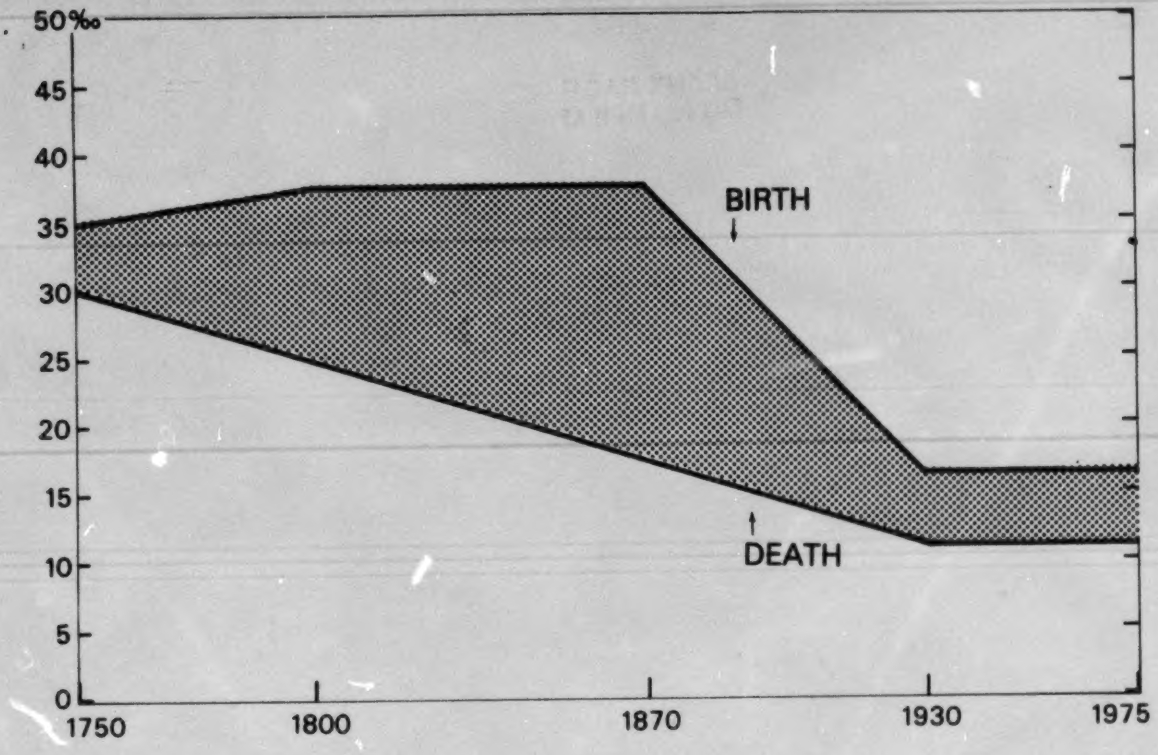
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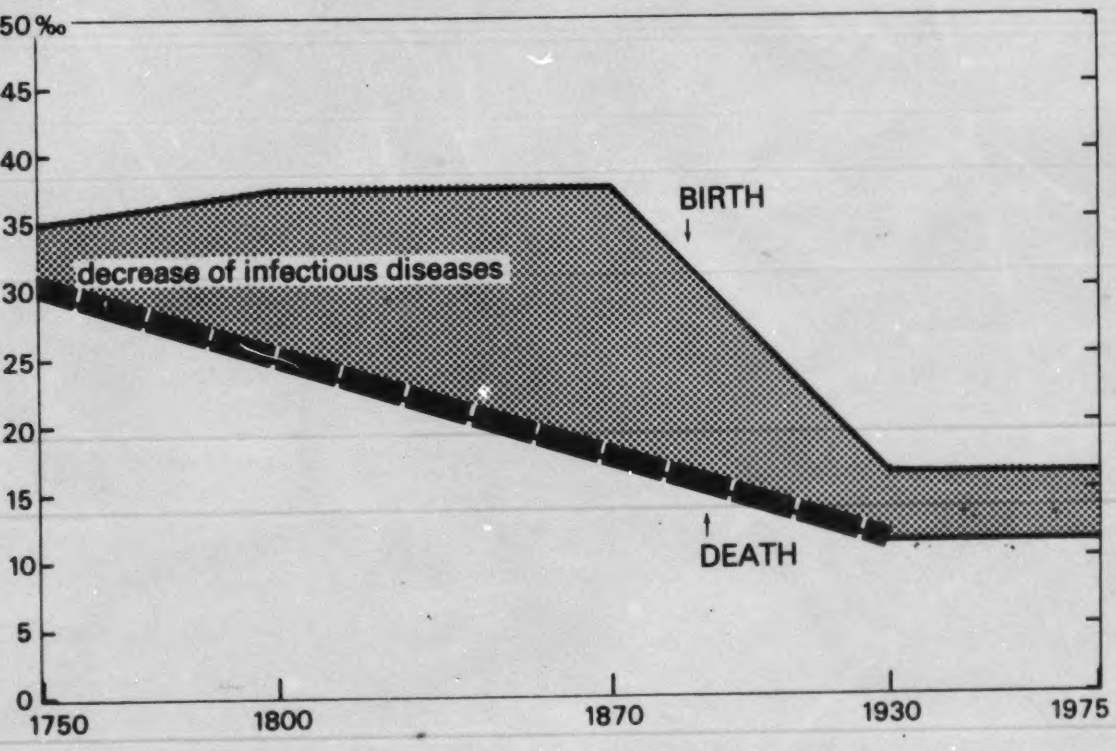
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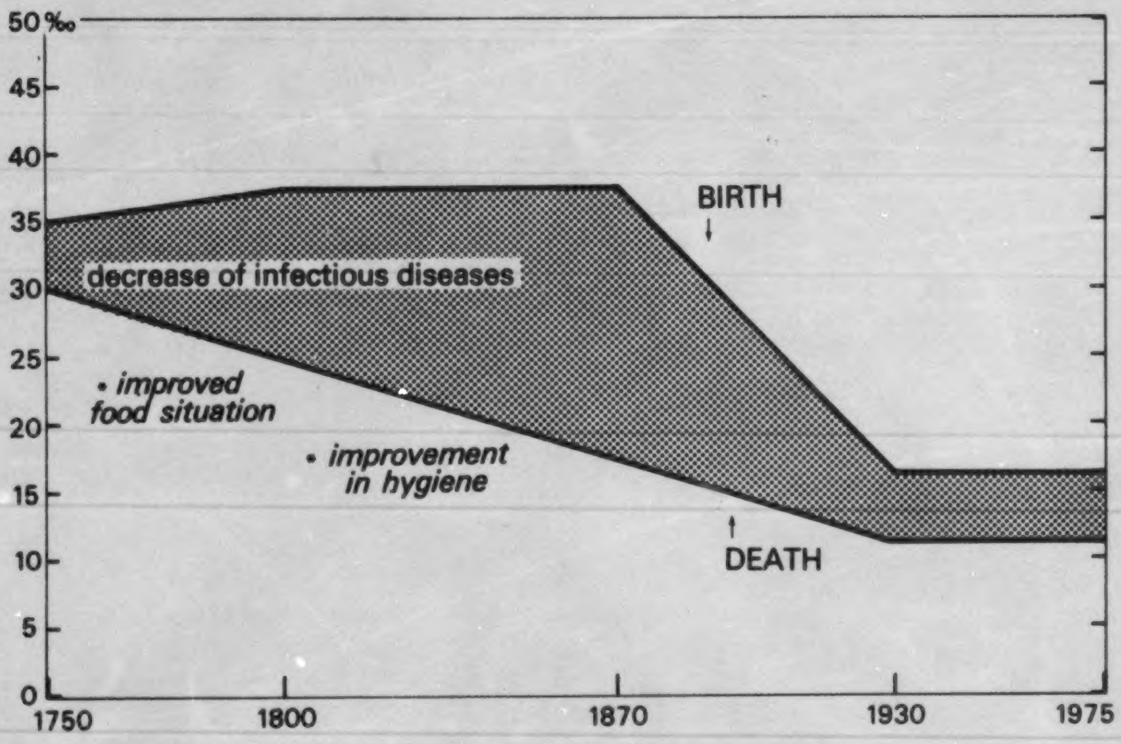
BIRTH
DEATH
decrease of infectious diseases

28

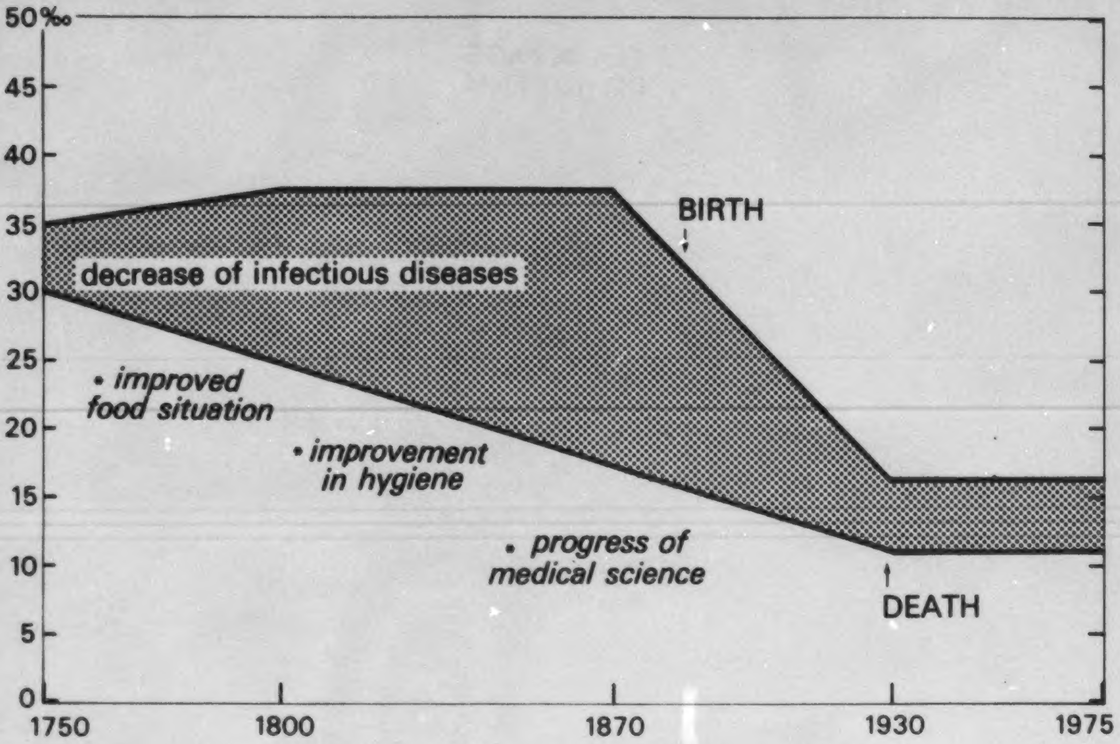
DECREASE OF INFECTIOUS DISEASES :

- INCREASING PROSPERITY
- IMPROVED FOOD SITUATION



52

47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45
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1750
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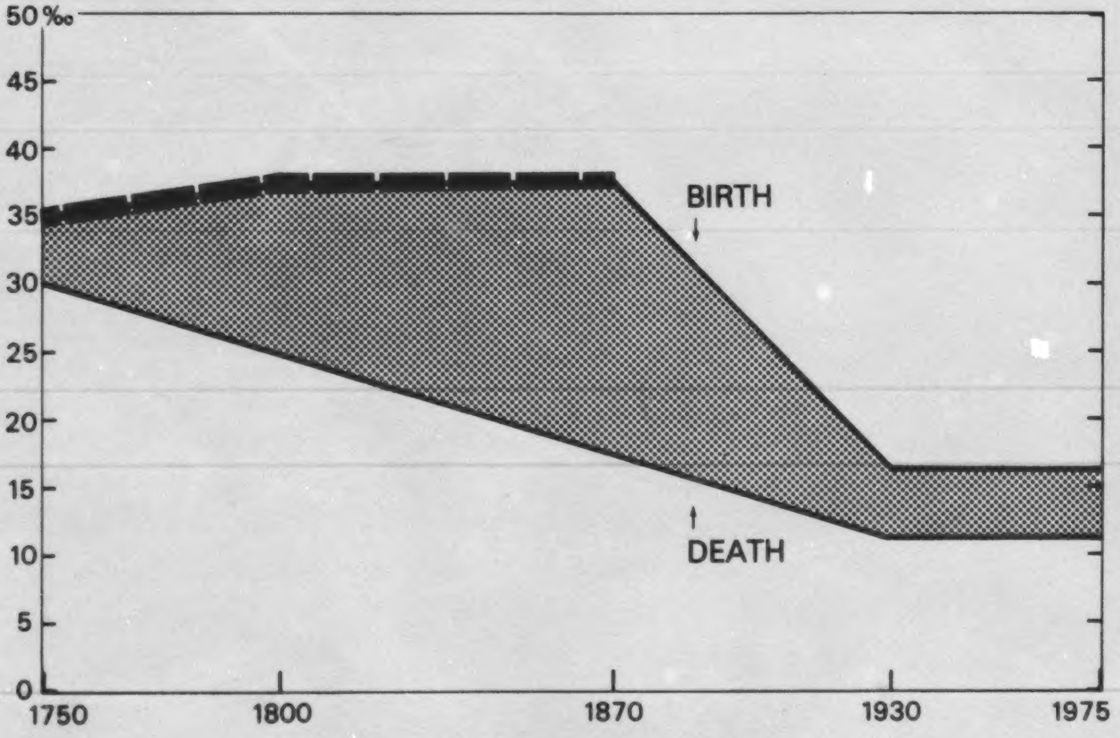
1870
1930
1975
BIRTH
DEATH
decrease of infectious diseases
• improved food situation
• improvement in hygiene
• progress of medical science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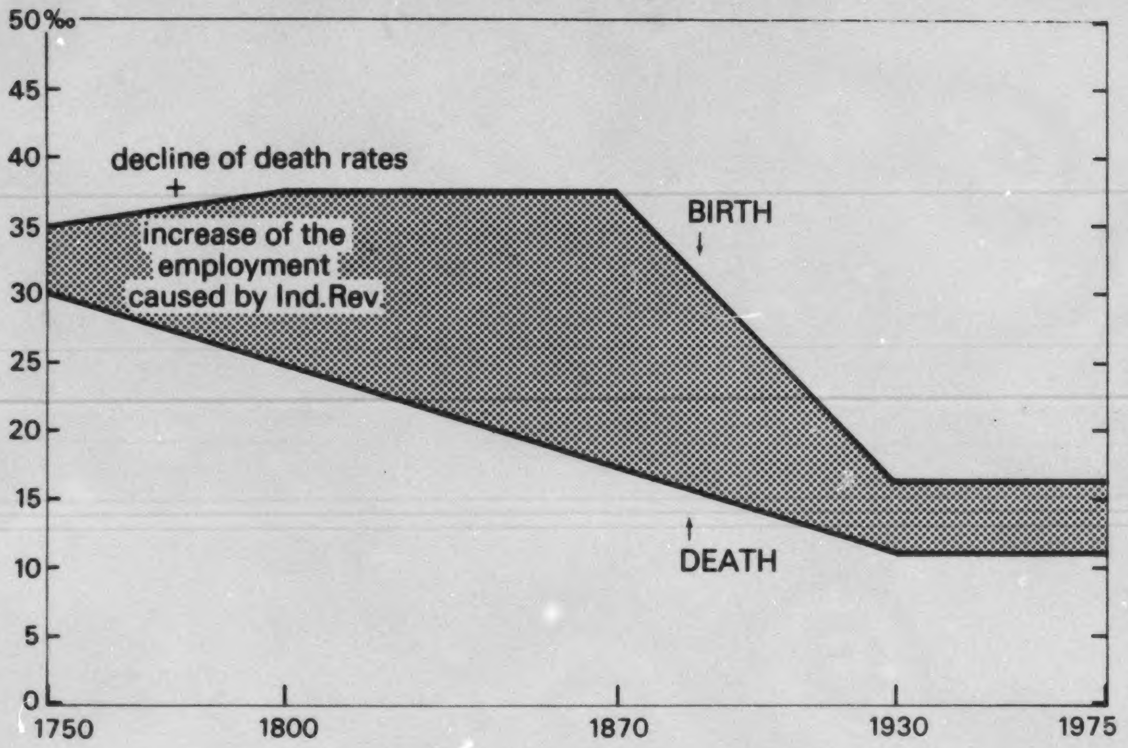
BIRTH
DEATH



SPECIFIC CHARACTERISTICS OF WESTERN EUROPEAN MARRIAGE PATTERN.

A COUPLE WAS ONLY ABLE TO MARRY IF:

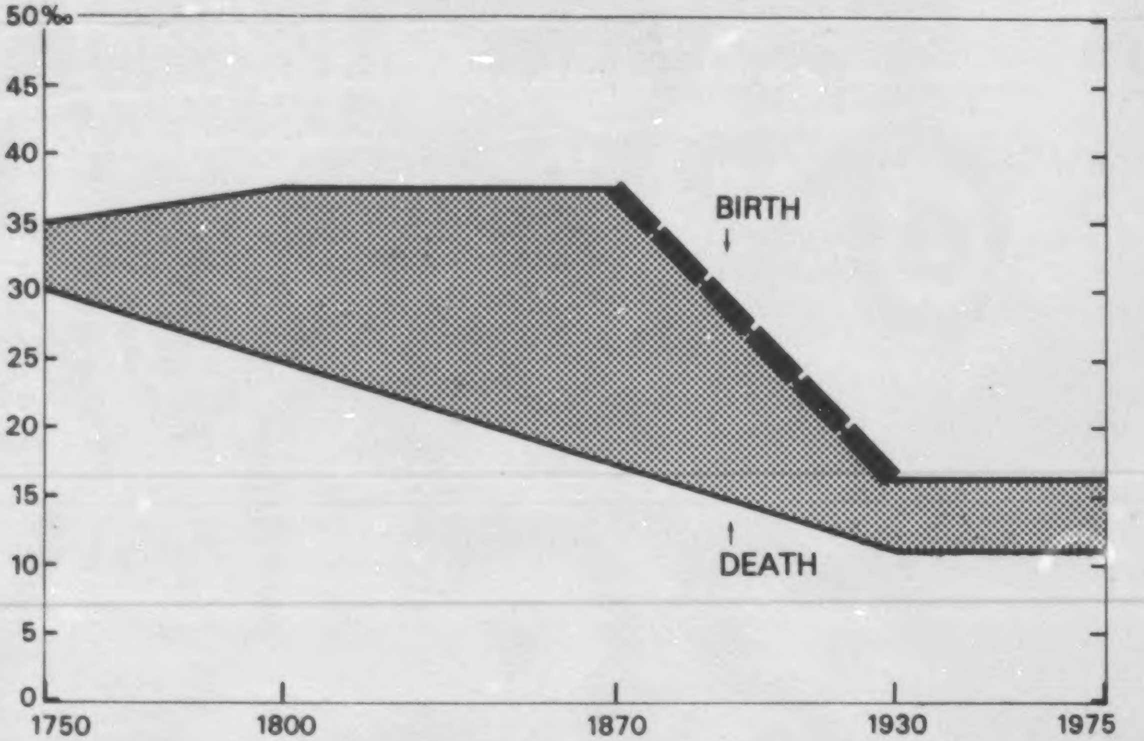
- THEY HAD SAVED SUFFICIENT MONEY
- THEY COULD PROVIDE THEIR OWN LIVING ACCOMODATION
- THEY COULD THEMSELVES SUPPORT THEIR FAMILY

UNTIL 1870 THE AVERAGE SIZE OF FAMILIES WAS LARGE, BECAUSE:

- HIGH DEATH RATE IN CHILDHOOD
- CHILDREN COULD EARN MONEY FOR THE FAMILY AT AN EARLY AGE
- CHILDREN COULD BE EXPECTED TO LOOK AFTER THEIR PARENTS WHEN THEY WERE OF ADVANCED AGE (NO SOCIAL SECURITY)
- CHILD EDUCATION WAS OF LOW COST

GRADUALLY, AFTER 1870, THE AVERAGE SIZE OF FAMILY DECREASED :

- DEATH RATE IN CHILDHOOD DECLINED
- STATE BEGAN TO TAKE RESPONSIBILITY FOR SOCIAL SECURITY
- CHILD LABOUR WAS FORBIDDEN
- COMPULSORY EDUCATION
- INCREASING SOCIAL MOBILITY
- CHILD EDUCATION WAS MORE COSTLY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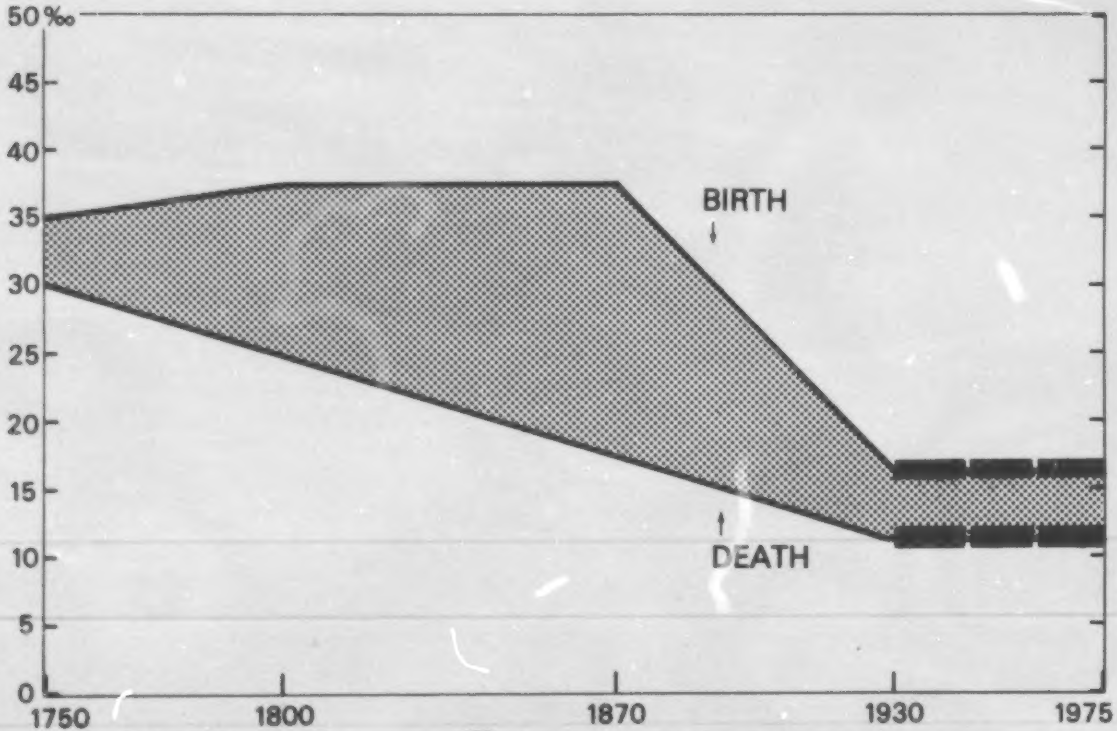
1870
1930
1975
BIRTH
DEATH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1750
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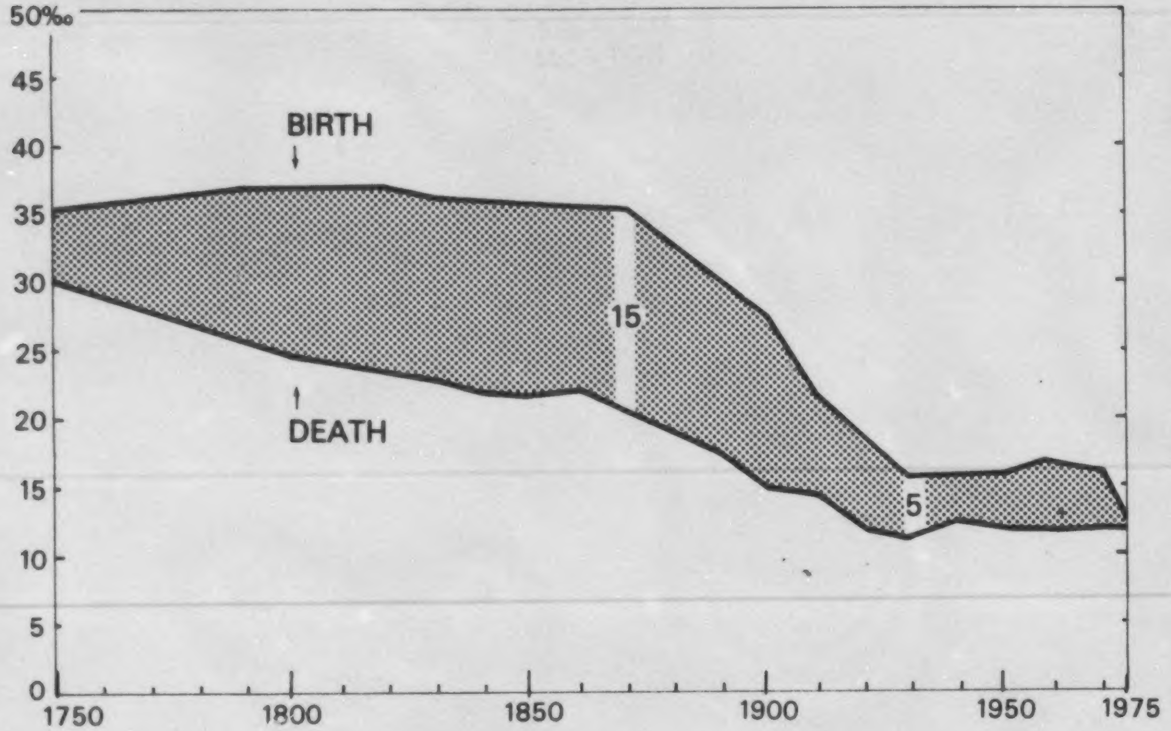
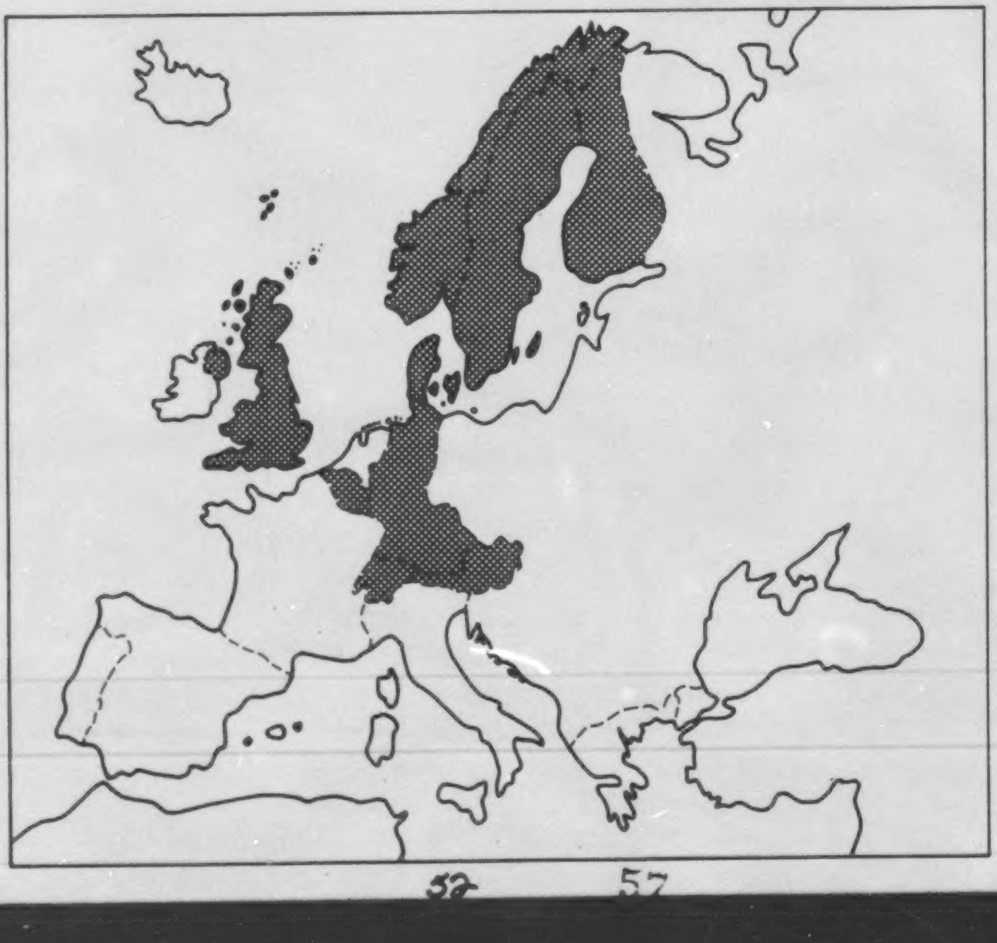
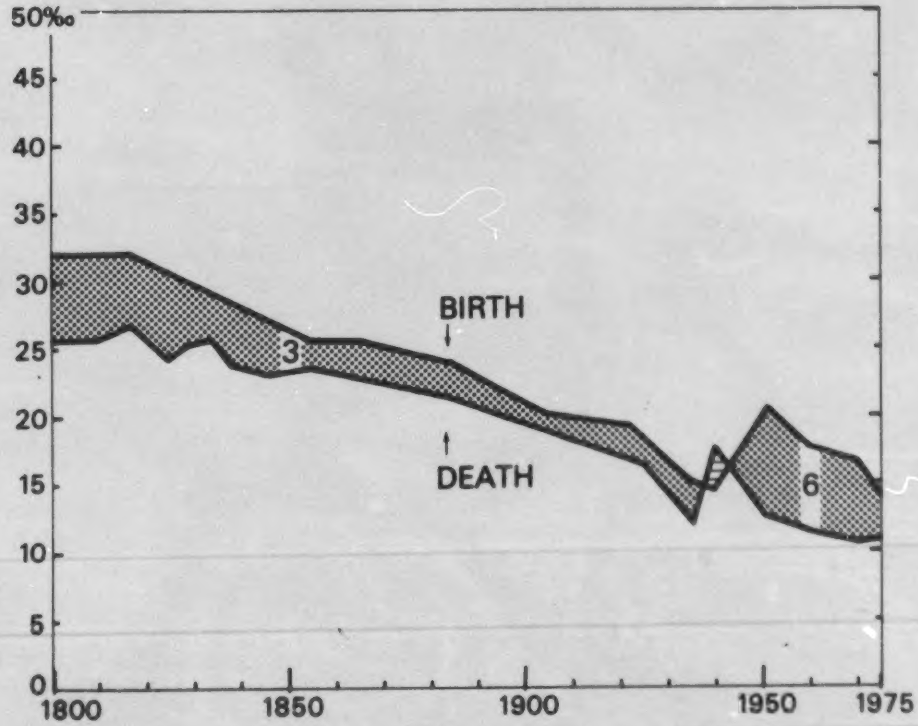
1870
1930
1975
BIRTH
DEATH

ENGLAND AND WALES





FRANCE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25
20
15
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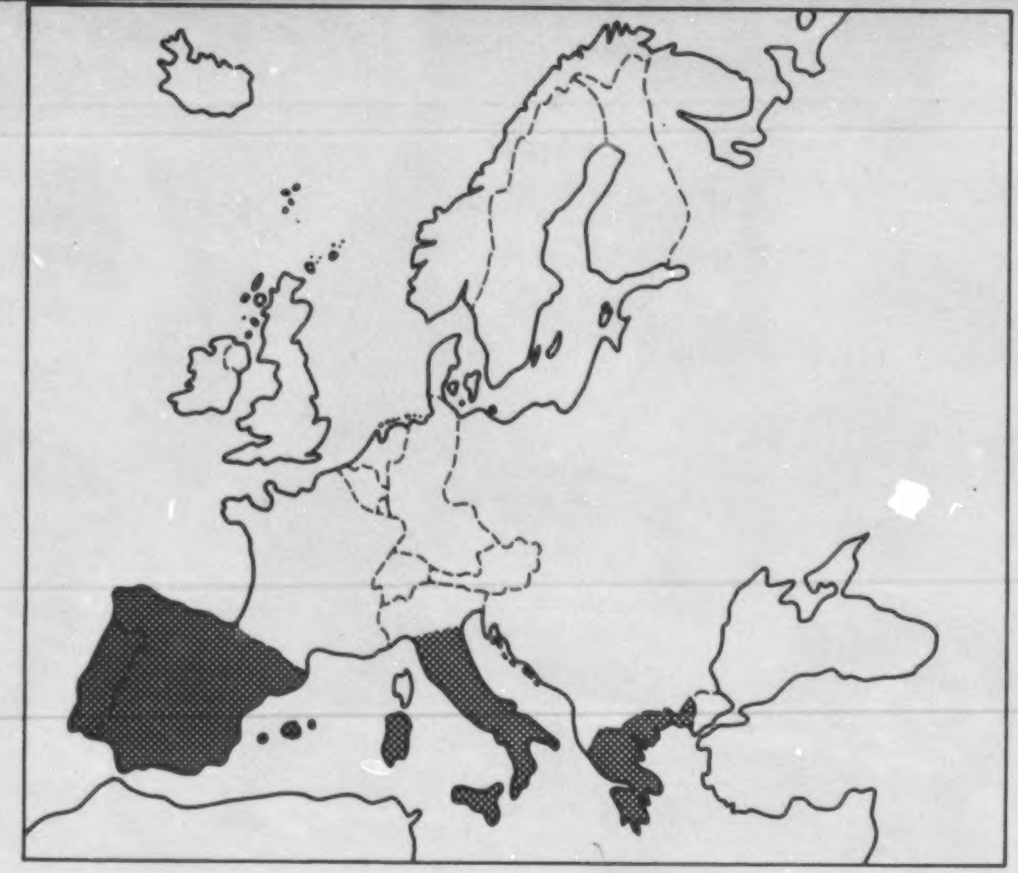
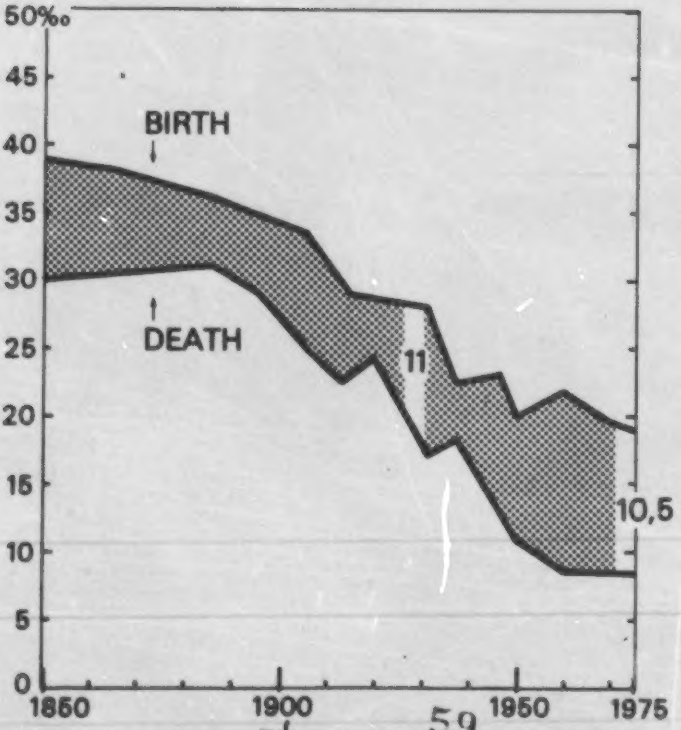
5
0
1800
1850
1900
1950
1975
BIRTH
DEATH
3
6



SPAIN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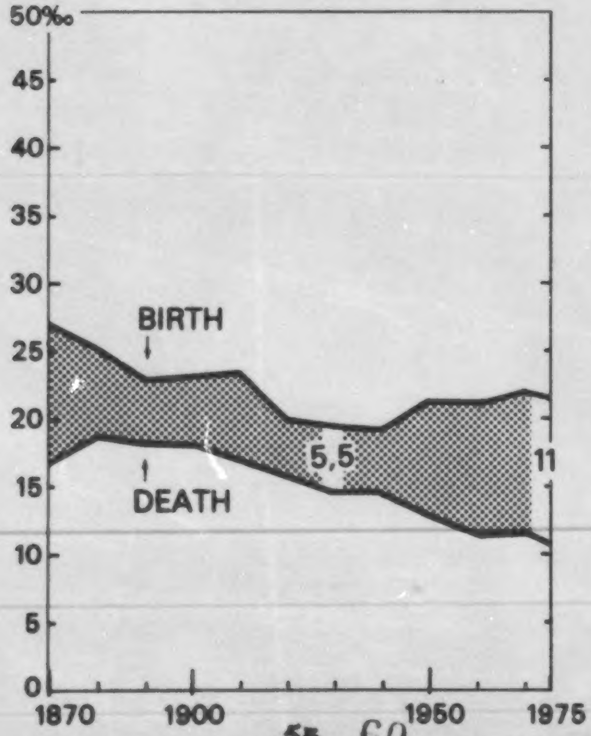
40
35
30
25
20
15
10
5
0
BIRTH
DEATH
11
10,5
1850
1900
1950
1975

54 59



IRELAND

50‰
45
40
35
30
25
20
15
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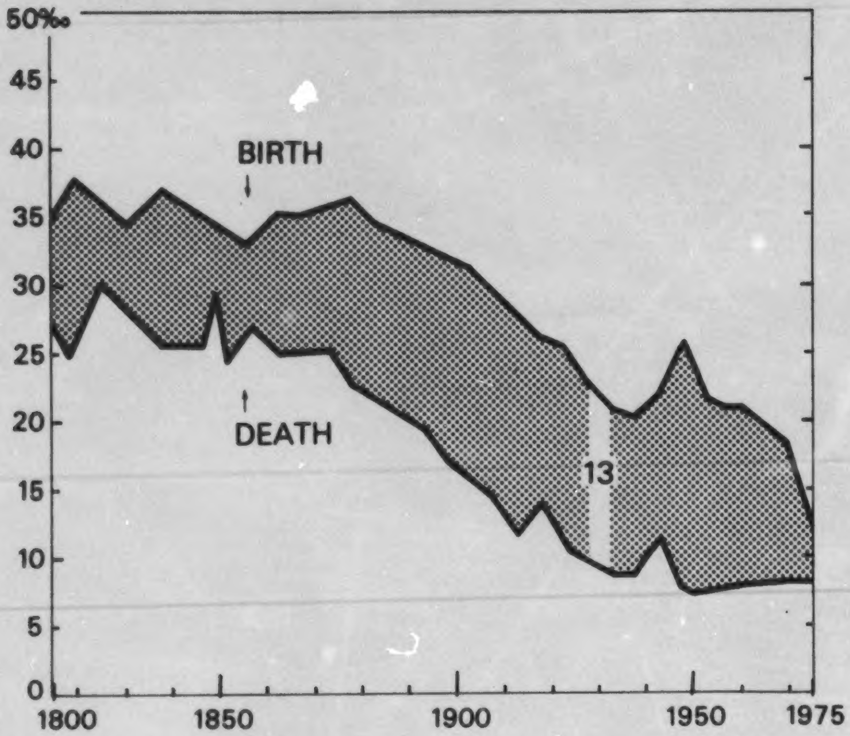
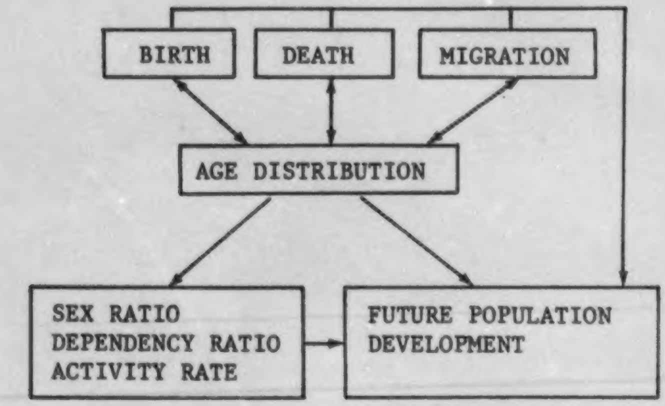
5
0
1870
1900
1950
1975
BIRTH
DEATH
5,5
11

THE NETHERLANDS

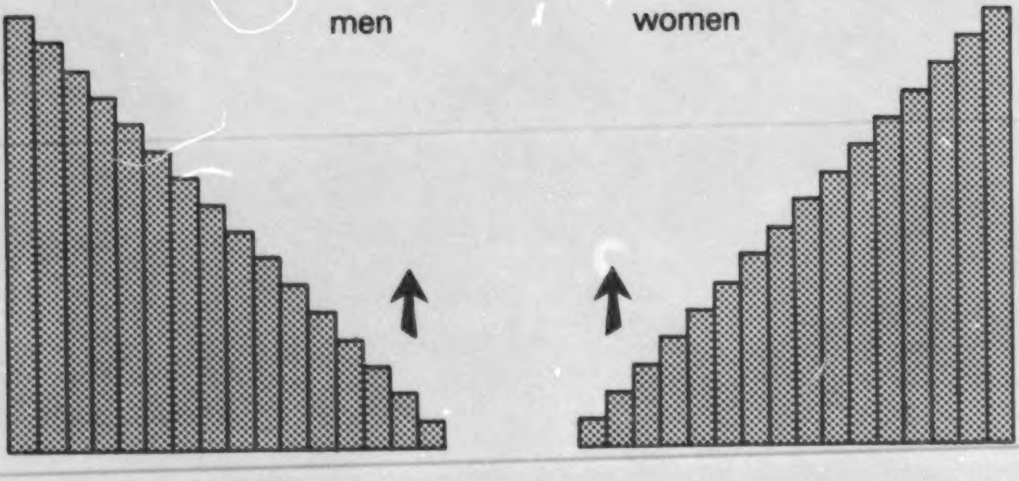


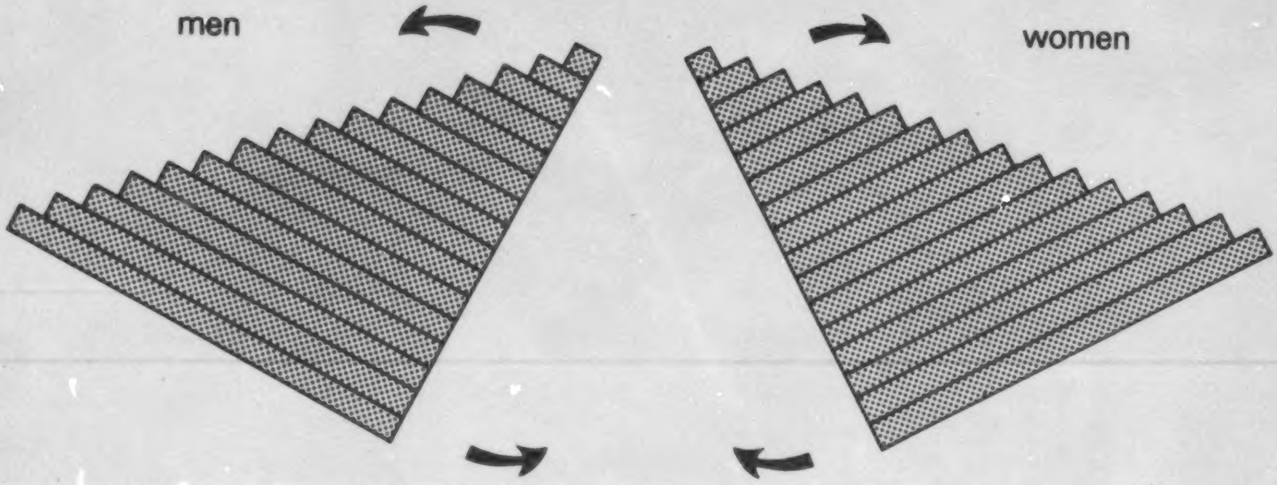
61

56

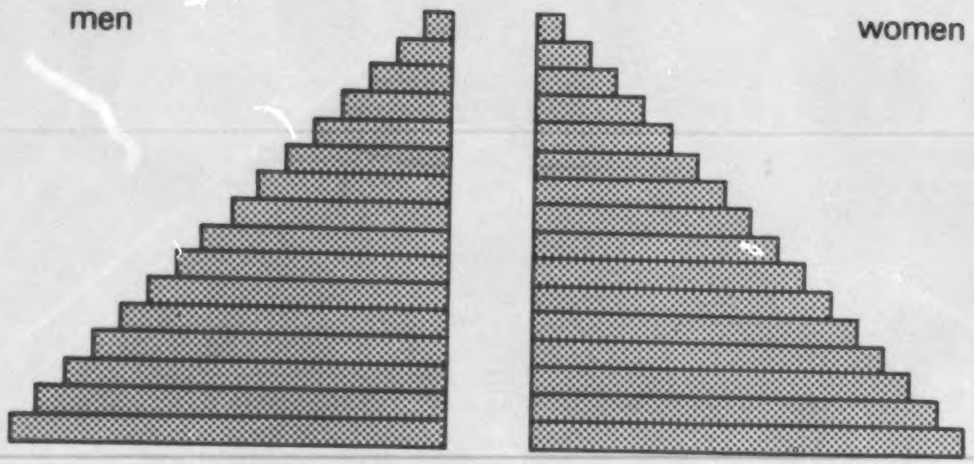

BIRTH
DEATH
MIGRATION
AGE DISTRIBUTION
SEX RATIO
DEPENDENCY RATIO
ACTIVITY RATE
FUTURE POPULATION
DEVELOPMENT

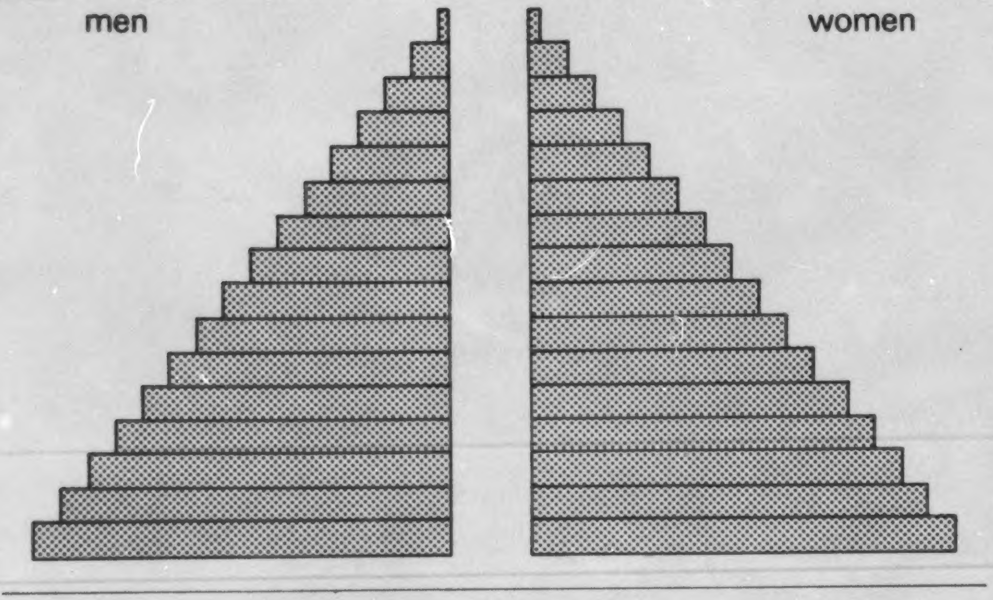
1

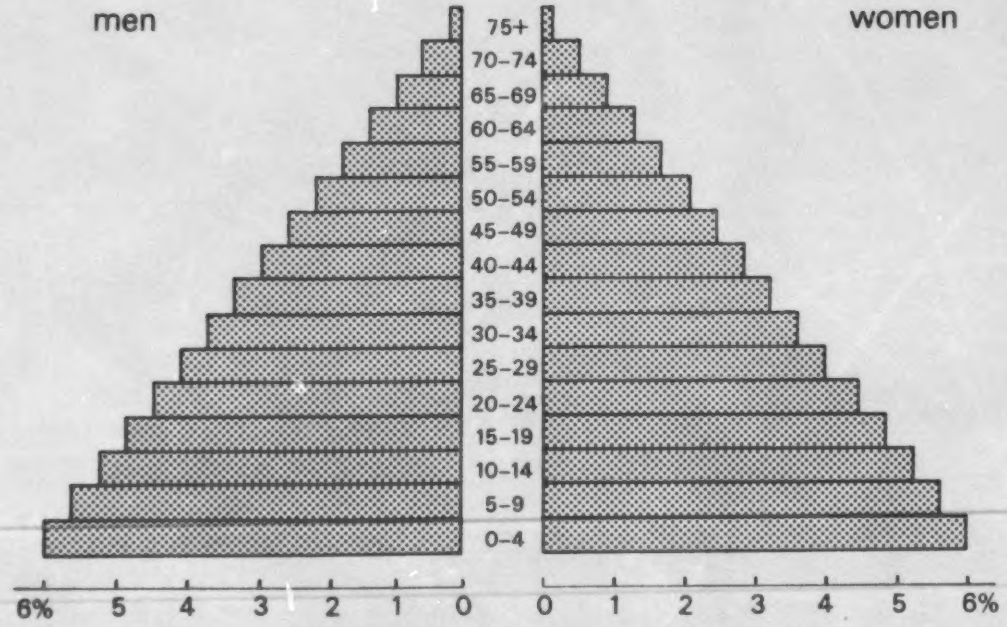

men
women



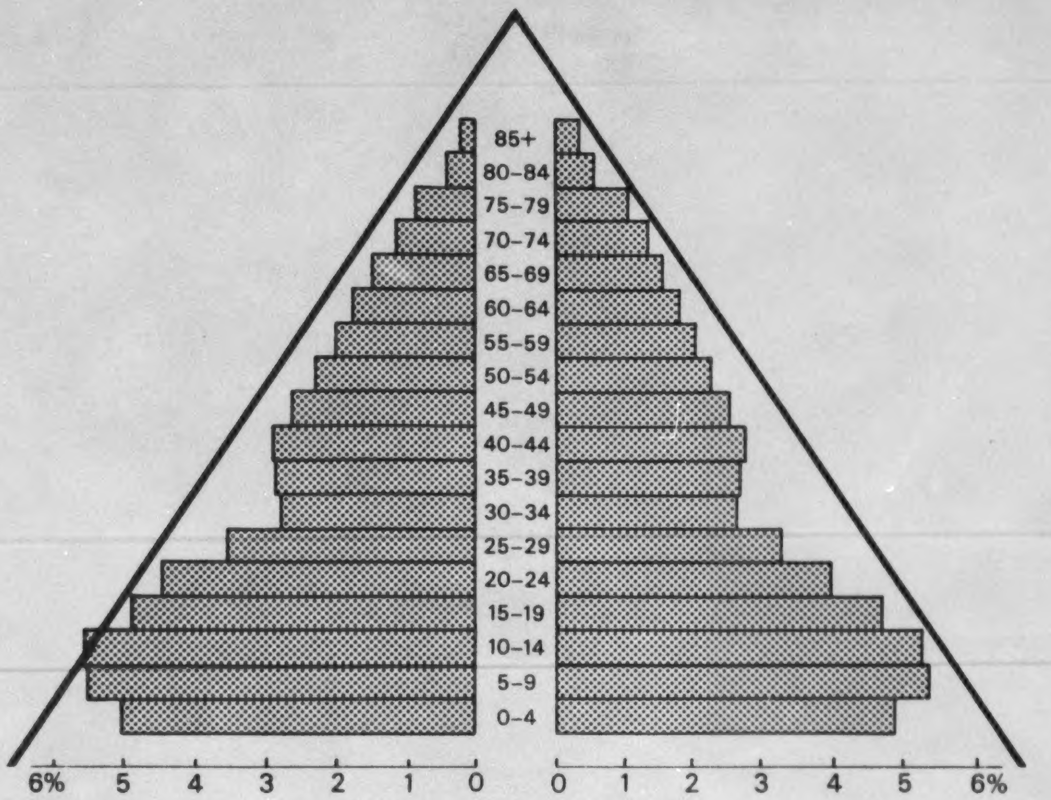
3



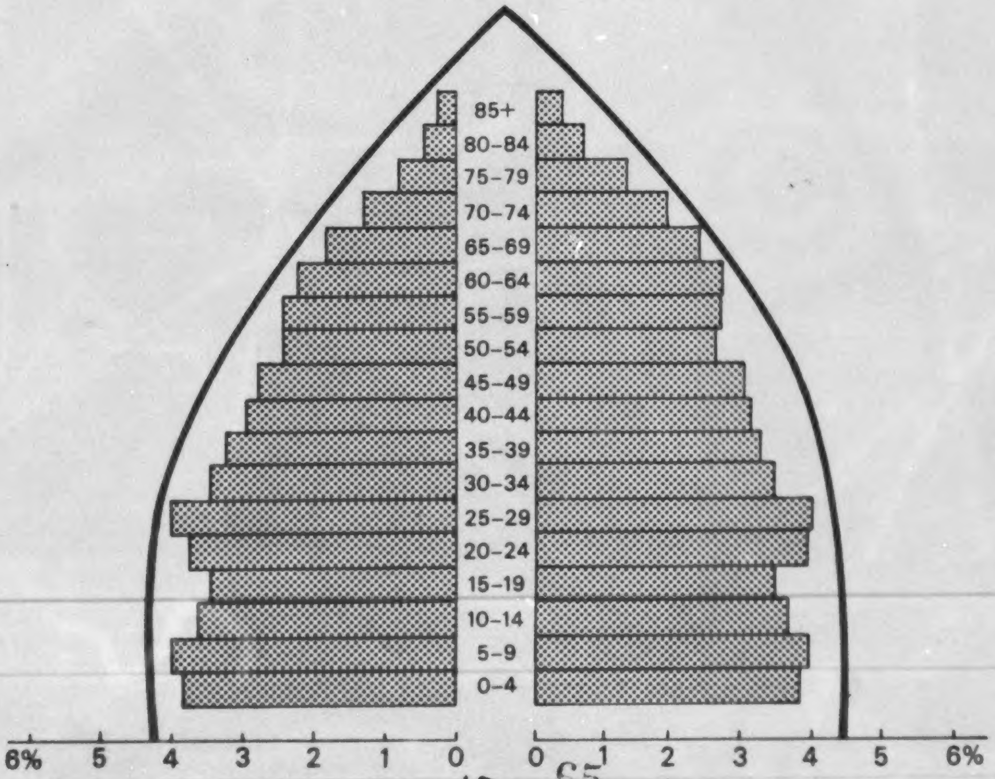

men
women

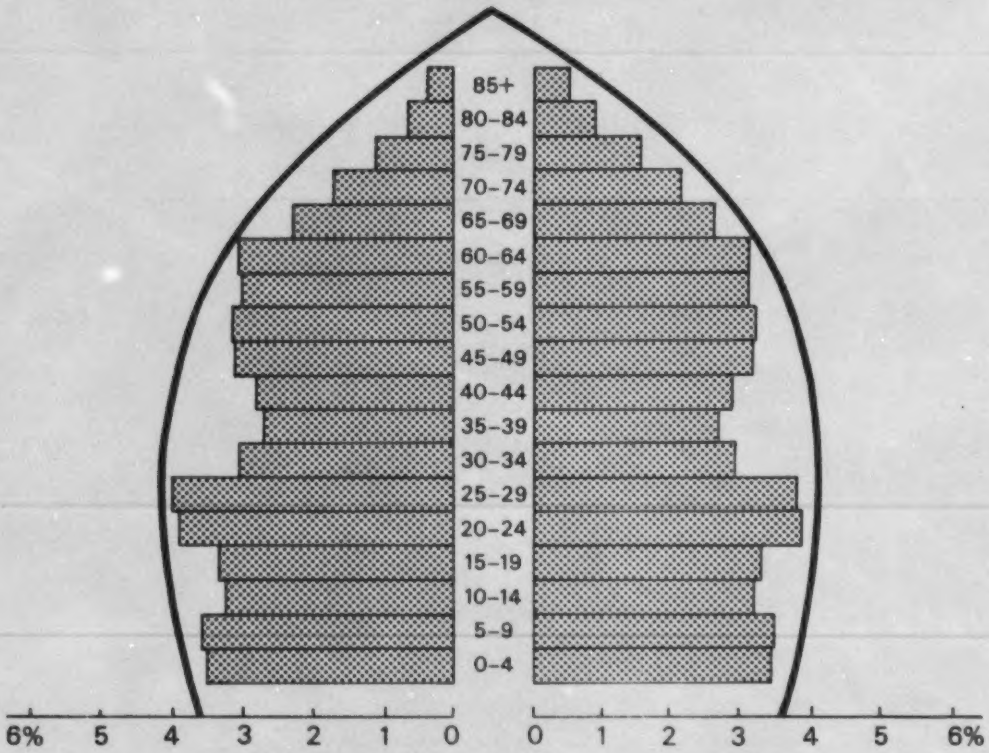

men
women
75+
70–74
65–69
60–64
55–59
50–54
45–49
40–44
35–39
30–34
25–29
20–24
15–19
10–14
5–9
0–4
6%
5
4
3
2
1
0
0
1
2
3
4
5
6%

ICELAND 1970

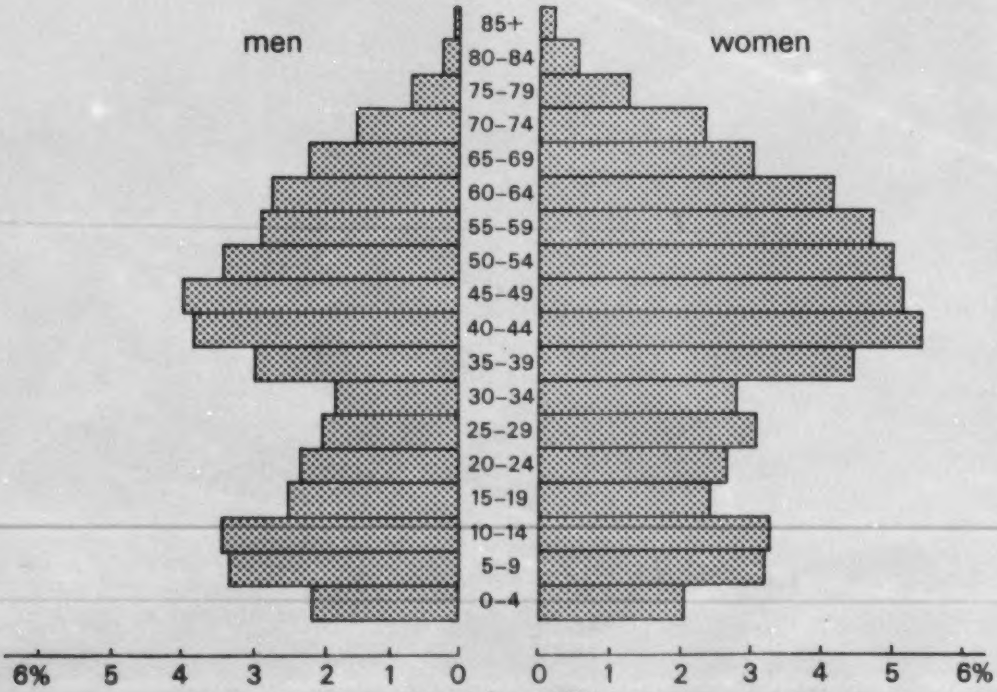


SWITZERLAND 1971

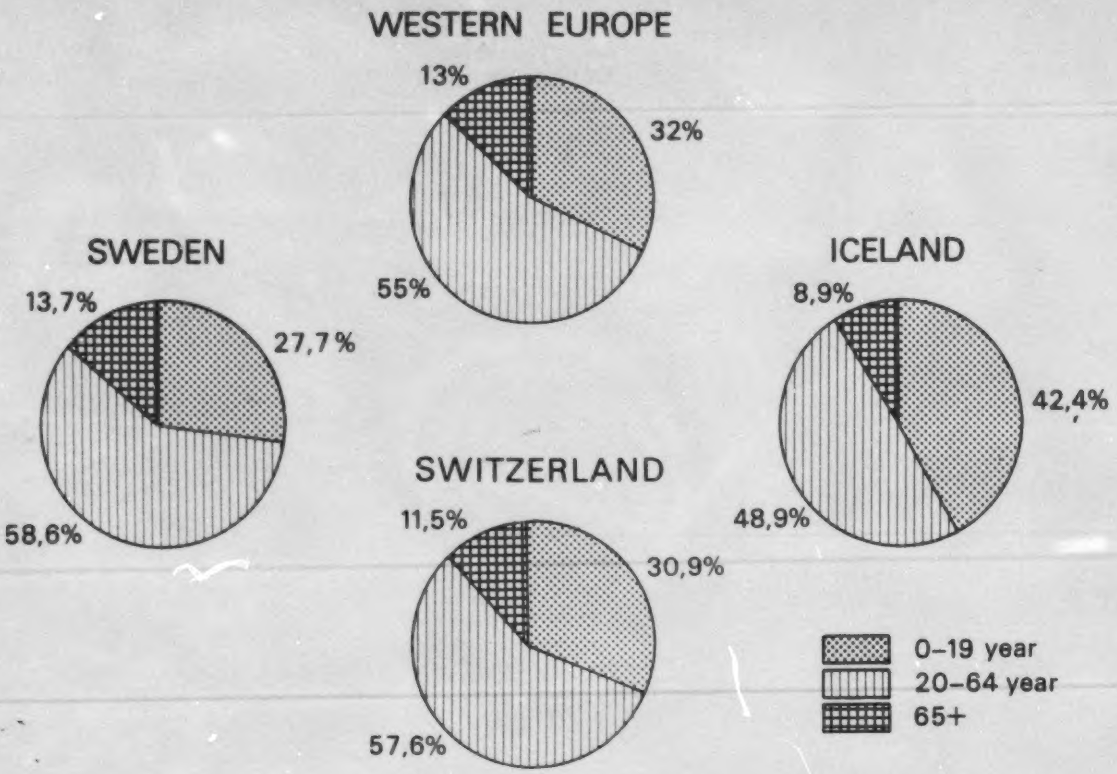




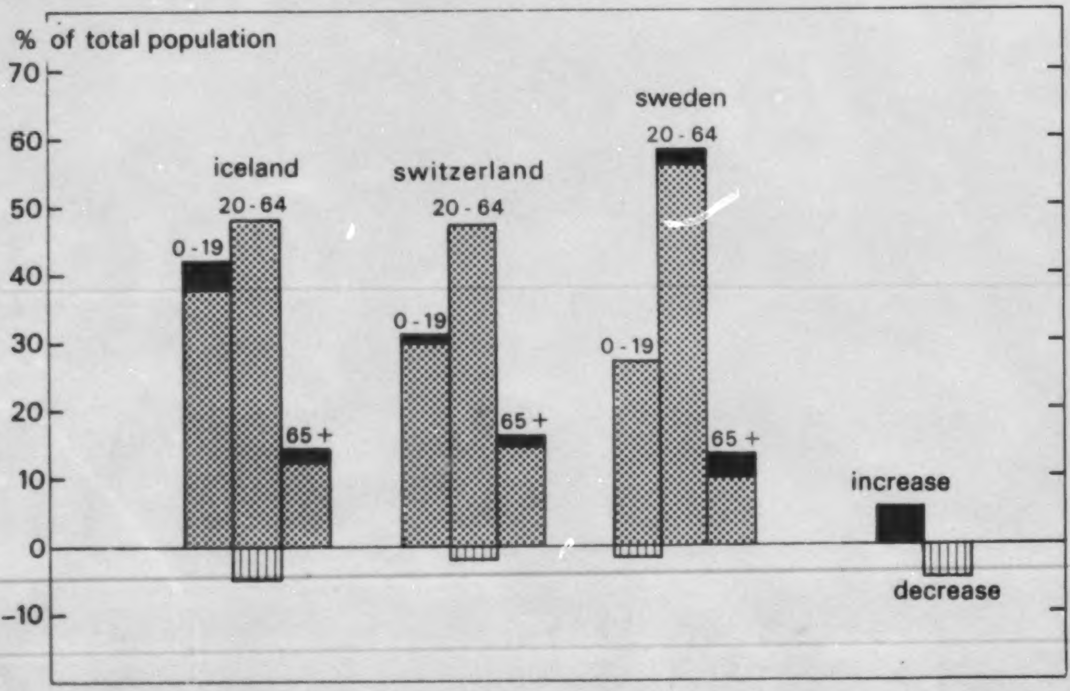
SWEDEN 1971



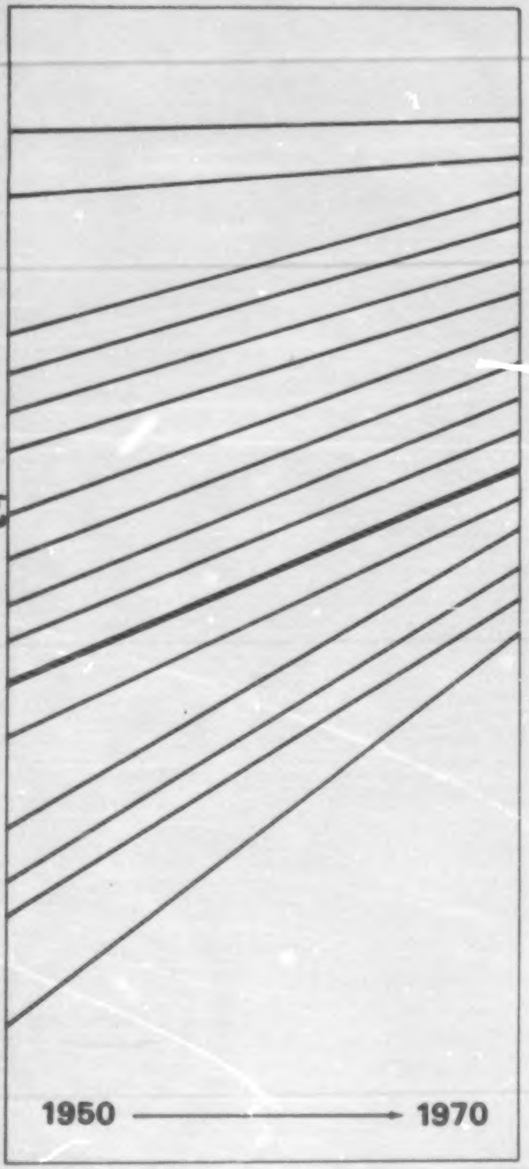
WEST BERLIN 1950



CHANGES IN THE AGE DISTRIBUTION 1950–1970

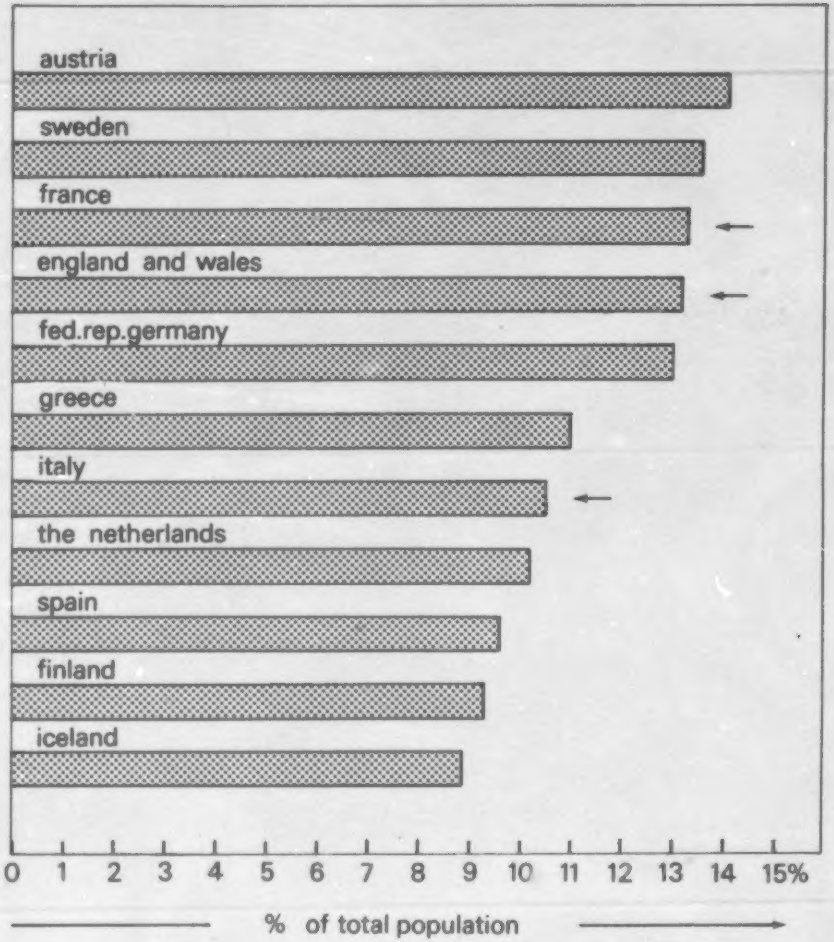


INCREASE IN THE PERCENTAGE 65+

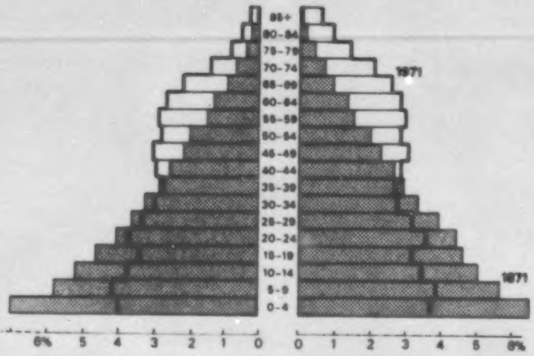


	%
finland	0.1
ireland	0.4
france	1.7
iceland	1.7
switzerland	1.8
portugal	1.9
spain	2.2
england	2.3
scotland	2.4
belgium	2.4
netherlands	2.5
italy	2.7
sweden	3.5
austria	3.6
denmark	3.6
greece	4.6

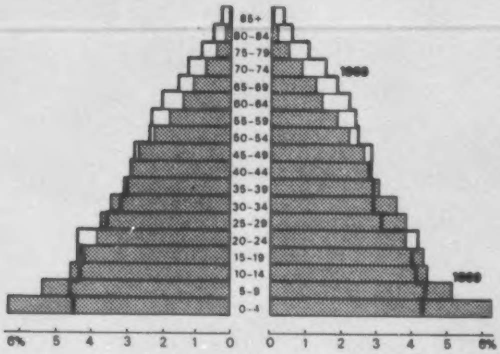
PERCENTAGE 65+



ENGLAND AND WALES 1871 AND 1971

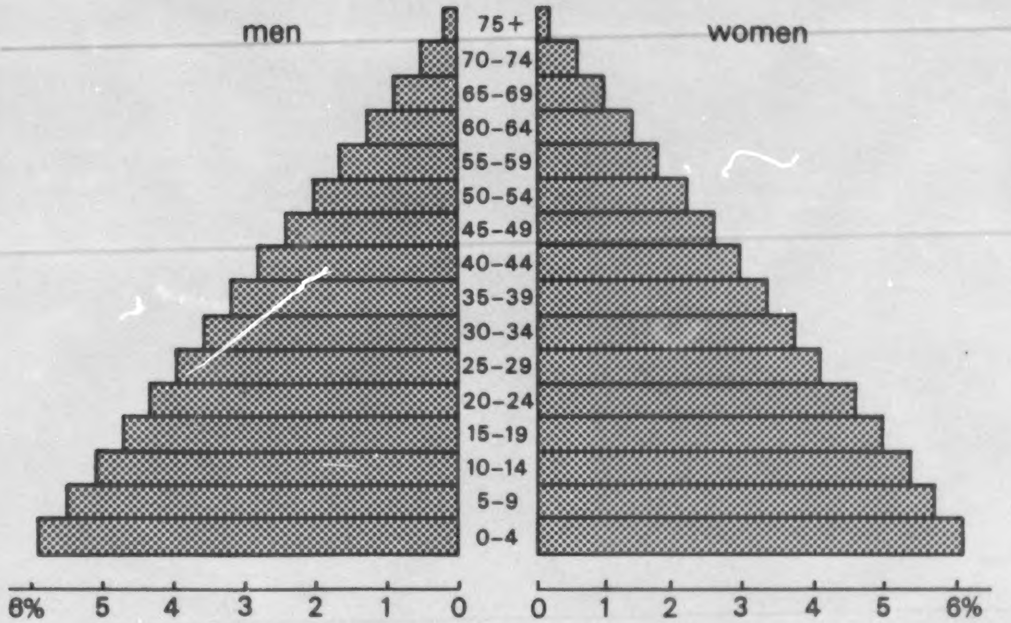


THE NETHERLANDS 1869 AND 1969



PERCENTAGE 65 OF AGE AND OVER IN 1950 AND 1970

	1950	1970	+/-
WORLD TOTAL	4,9	5,5	+ 0,6
DEVELOPING COUNTRIES	3,5	3,8	+ 0,3
INDUSTRIAL COUNTRIES	7,5	9,6	+ 2,1
SPECIFICATION:			
EUROPE	9,5	11,4	+ 1,9
U.S.S.R.	6,1	7,8	+ 1,7
NORTH AMERICA	8,1	9,7	+ 1,6
EAST ASIA	4,2	5,4	+ 1,2
LATIN AMERICA	3,3	3,7	+ 0,4
AUSTRALIA AND NEW ZEALAND	8,3	8,4	+ 0,1
SOUTH ASIA	3,3	3,1	- 0,2
AFRICA	3,3	3,0	- 0,3



$$\frac{\text{NUMBER OF MEN}}{\text{NUMBER OF WOMEN}} \text{ X } 100 = \text{SEX RATIO}$$

SEX RATIO, THE NETHERLANDS, 1972

$$\frac{6.676.000}{6.712.000} \text{ X } 100 = 99.46$$

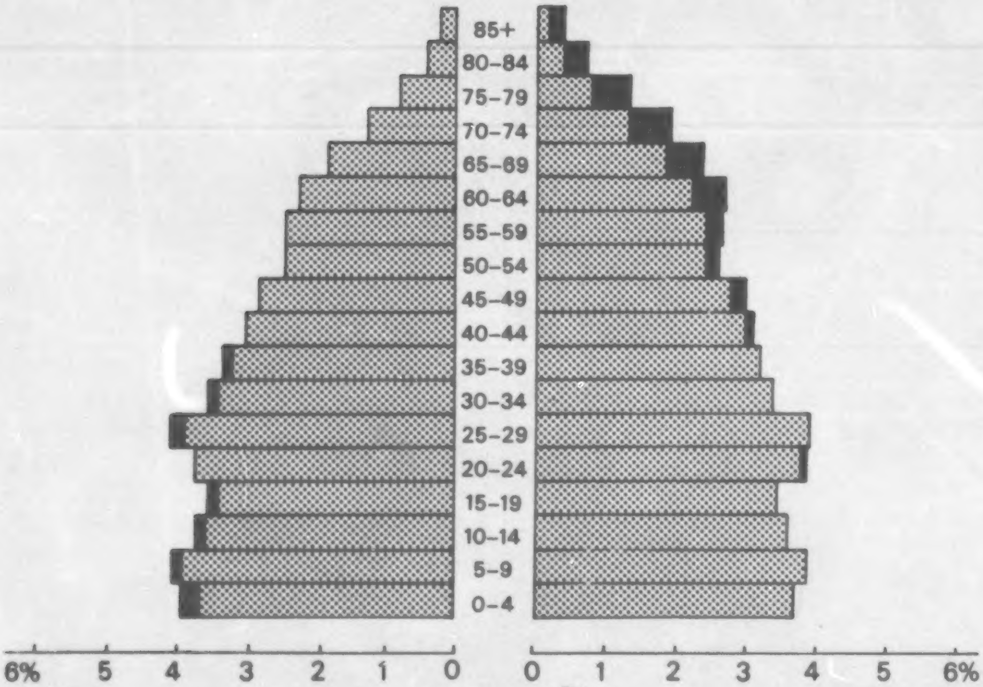
SEX RATIO (WESTERN) EUROPE, 1972

AUSTRIA	88,34
PORTUGAL	90,53
FED.REP.GERMANY	91,34
FINLAND	93,51
ENGLAND + WALES	94,52
FRANCE	95,42
ITALY	95,45
SWITZERLAND	95,56
SPAIN	95,66
BELGIUM	95,96
DENMARK	98,53
NORWAY	98,93
THE NETHERLANDS	99,69
SWEDEN	99,78
IRELAND	100,94
AVERAGE	95,61

SEX RATIO IN THE WORLD, 1965

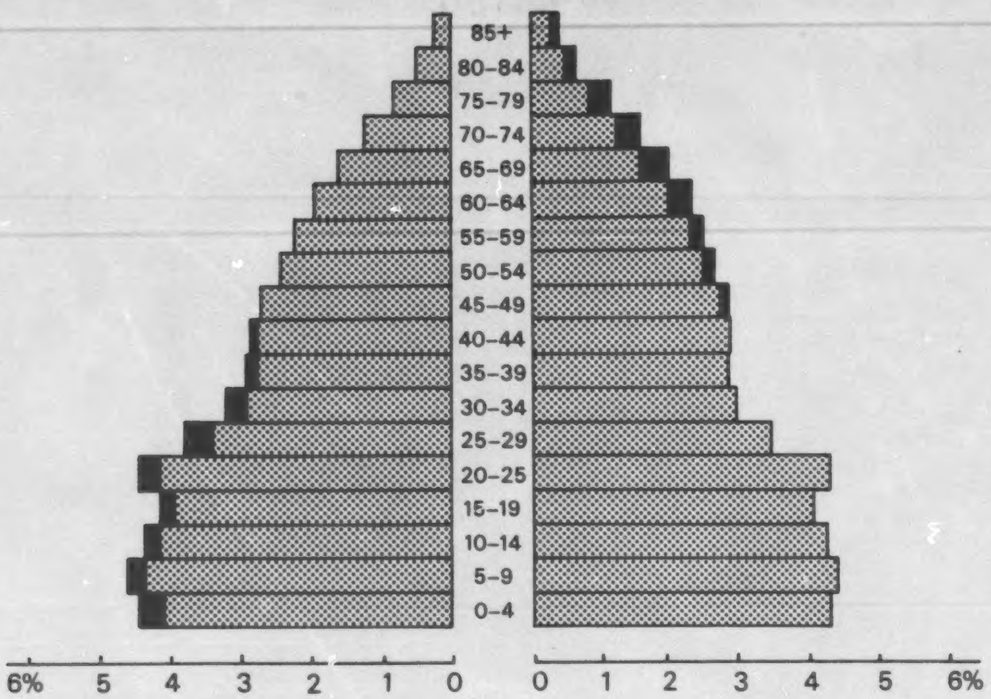
WORLD TOTAL	99,2
DEVELOPING COUNTRIES	102,2
INDUSTRIAL COUNTRIES	93,0
SPECIFICATION:	
SOUTH ASIA	104,4
LATIN AMERICA	100,5
EAST ASIA	100,3
AFRICA	99,4
AUSTRALIA AND NEW ZEALAND	102,8
NORTH AMERICA	97,5
EUROPE	94,1
U.S.S.R.	84,3

SWITZERLAND 1971

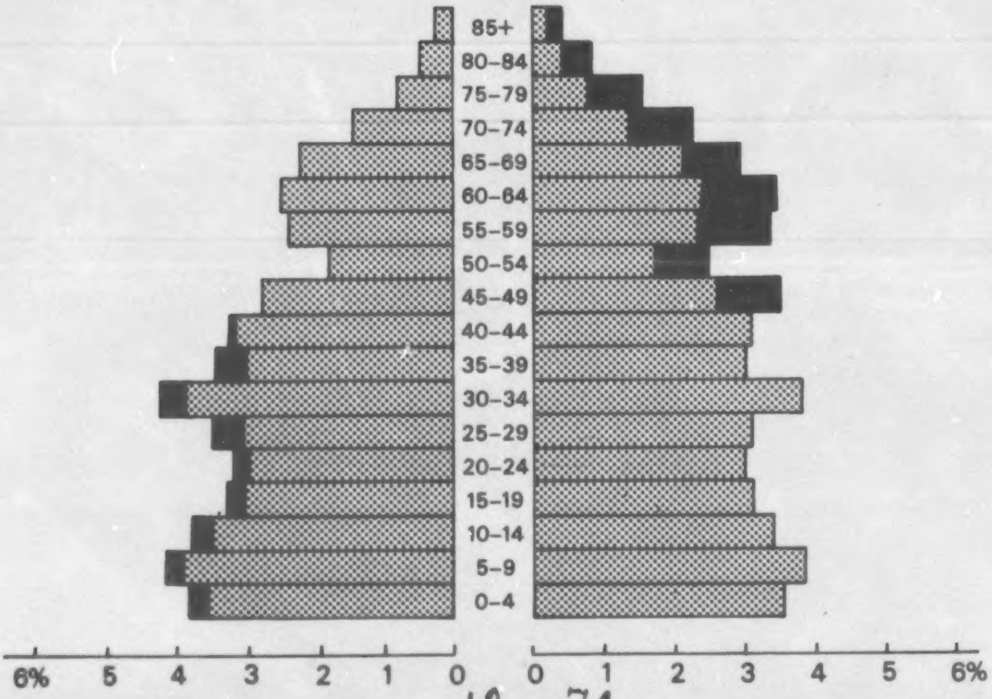


67 73

THE NETHERLANDS 1971

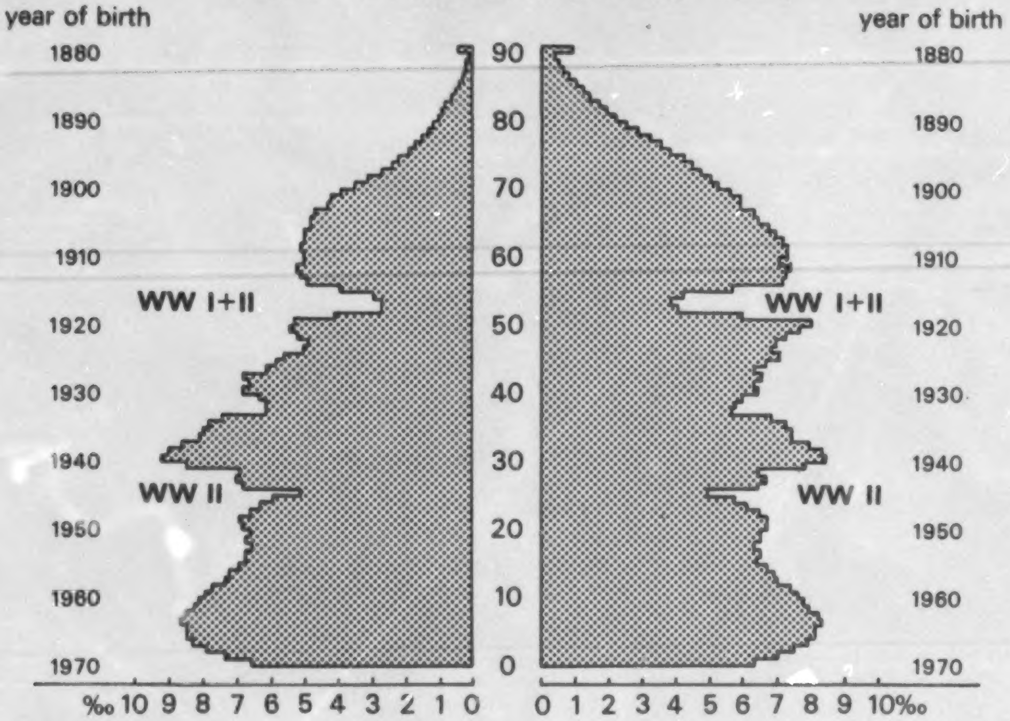


FEDERAL REPUBLIC GERMANY 1970

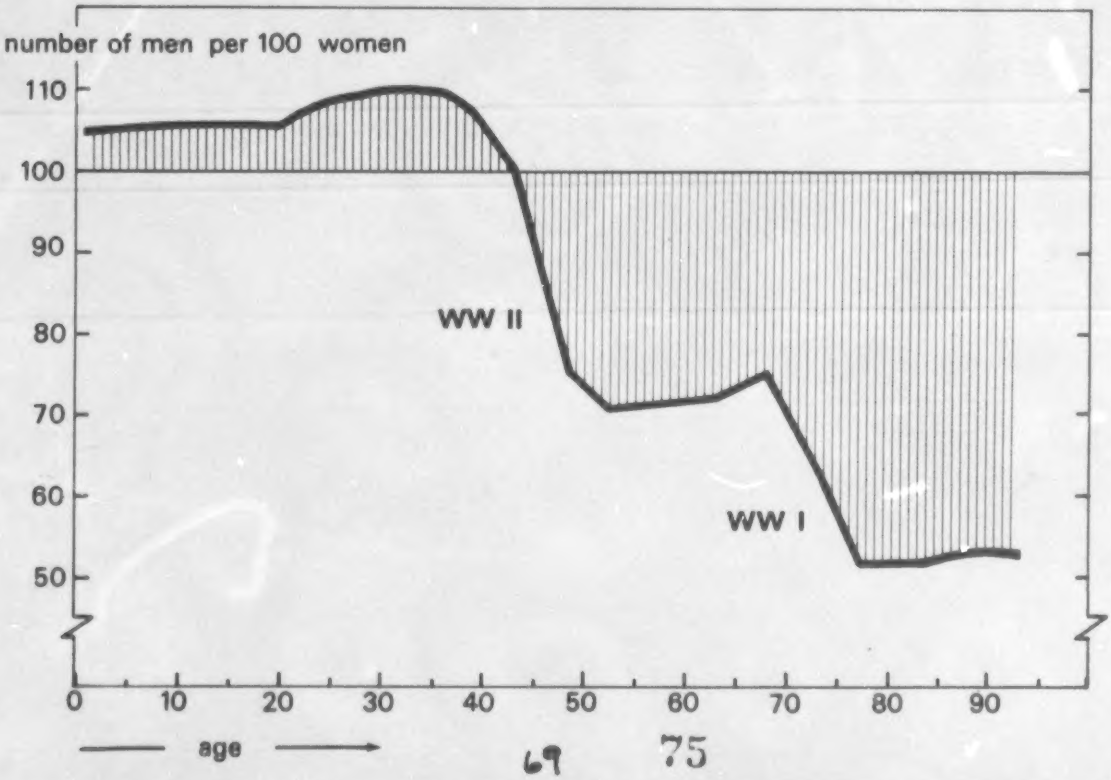


68 74

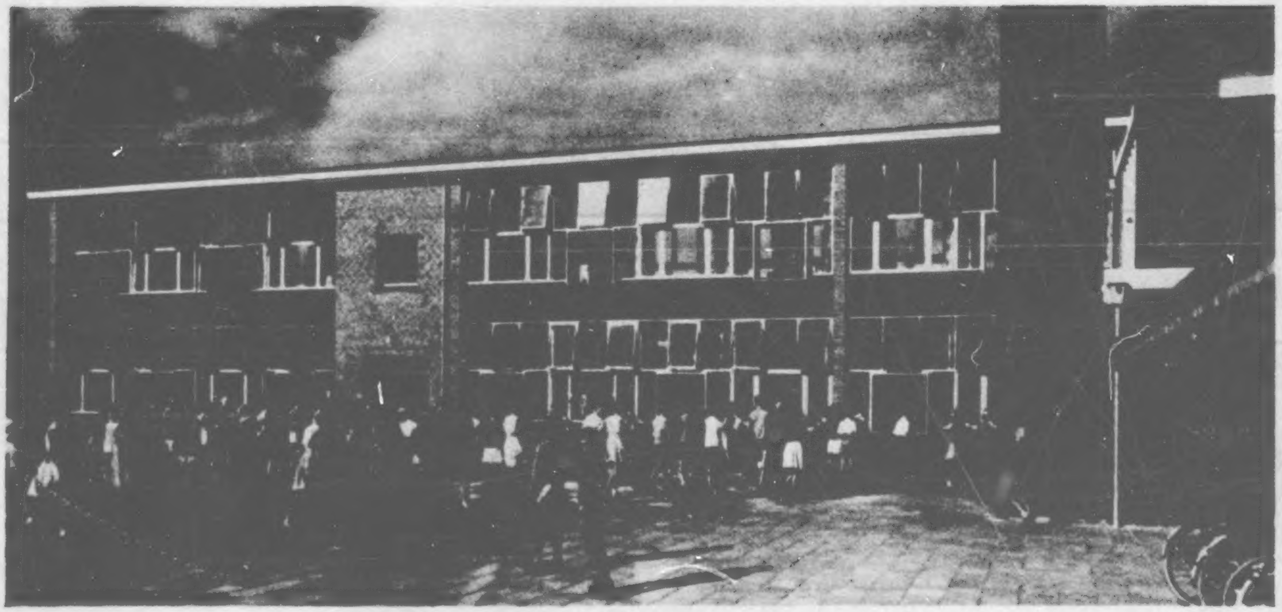
FEDERAL REPUBLIC GERMANY 1970

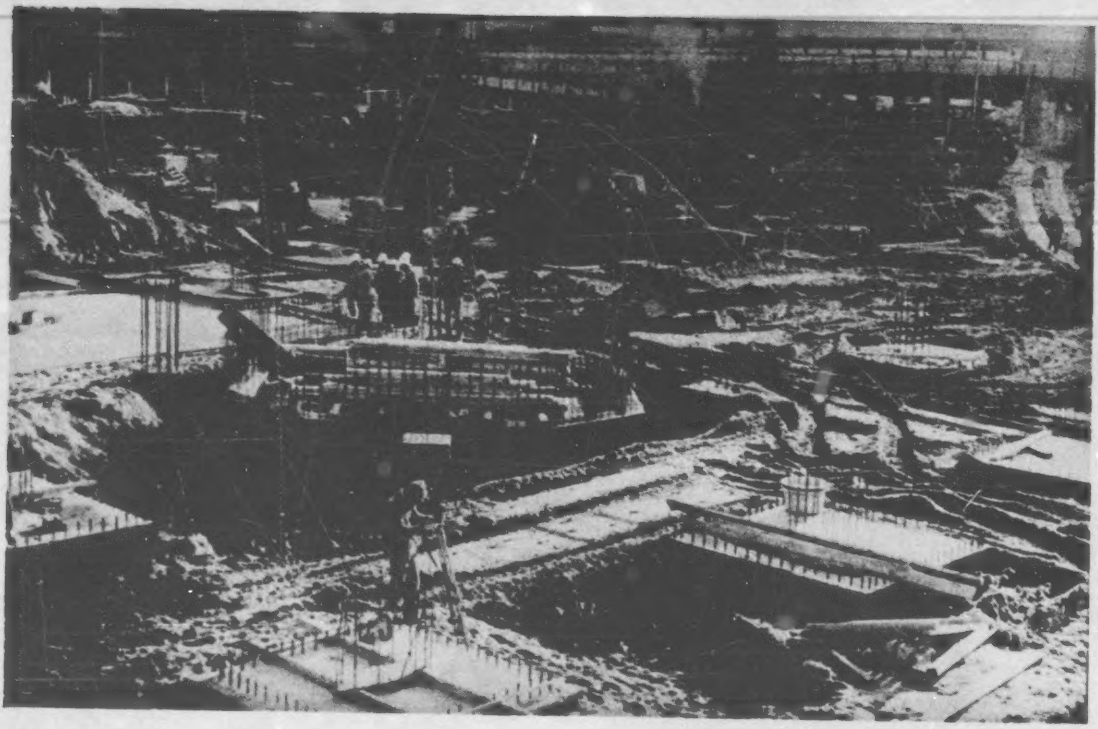


SEX RATIO FED. REP. GERMANY 1970



AGE-BANDS	PARTICULAR FACILITIES
0 - 19	EDUCATION
20 - 64	EMPLOYMENT
65^+	CARE FOR THE ELDERLY





29

30

$$\frac{(0 - 19) + 65^{+}}{20 - 64} \times 100 = \text{DEPENDENCY RATIO}$$

DEPENDENCY RATIO, THE NETHERLANDS, 1970

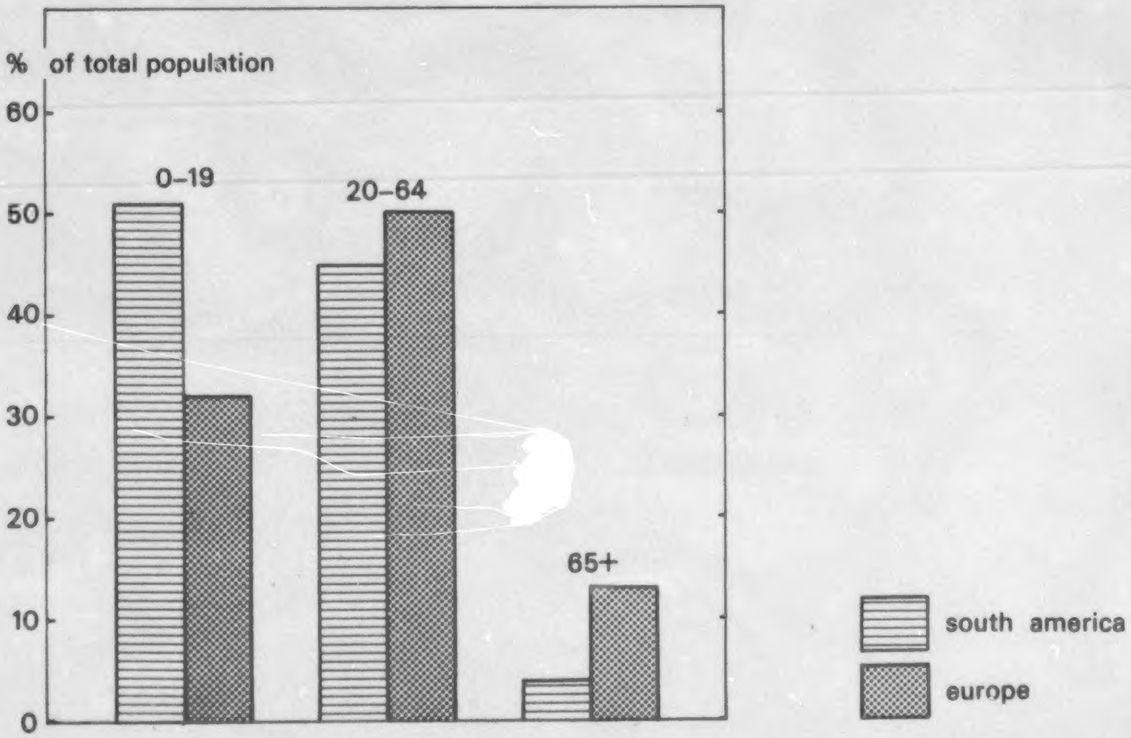
$$\frac{4.678.829 + 1.339.739}{7.100.945} \times 100 = 84{,}8$$

78

DEPENDENCY RATIO 1970

IRELAND	103,4
THE NETHERLANDS	84,8
FRANCE	83,5
SPAIN	83,4
AUSTRIA	82,2
BELGIUM	79,9
ENGLAND + WALES	78,3
FED.REP.GERMANY	75,7
FINLAND	74,8
SWITZERLAND	73,7
ITALY	73,3
SWEDEN	70,0

AGE DISTRIBUTION WESTERN EUROPE AND SOUTH AMERICA 1970



73 79

DEPENDENCY RATIO DETERMINES, AMONG OTHERS, THE SHARE OF THE LABOUR FORCE IN THE TOTAL POPULATION.

LABOUR FORCE:

- WORKING POPULATION + PEOPLE SEEKING EMPLOYMENT.

$$\frac{\text{LABOUR FORCE}}{\text{TOTAL POPULATION}} \text{ X } 100 = \text{ACTIVITY RATE}$$

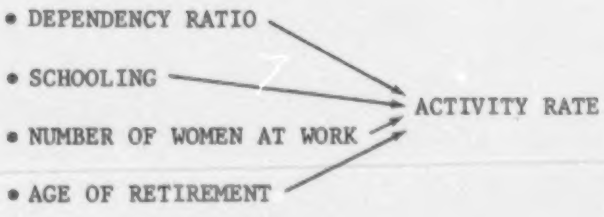
ACTIVITY RATE, THE NETHERLANDS, 1971

$$\frac{4.776.000}{13.269.000} \times 100 = 35,9$$

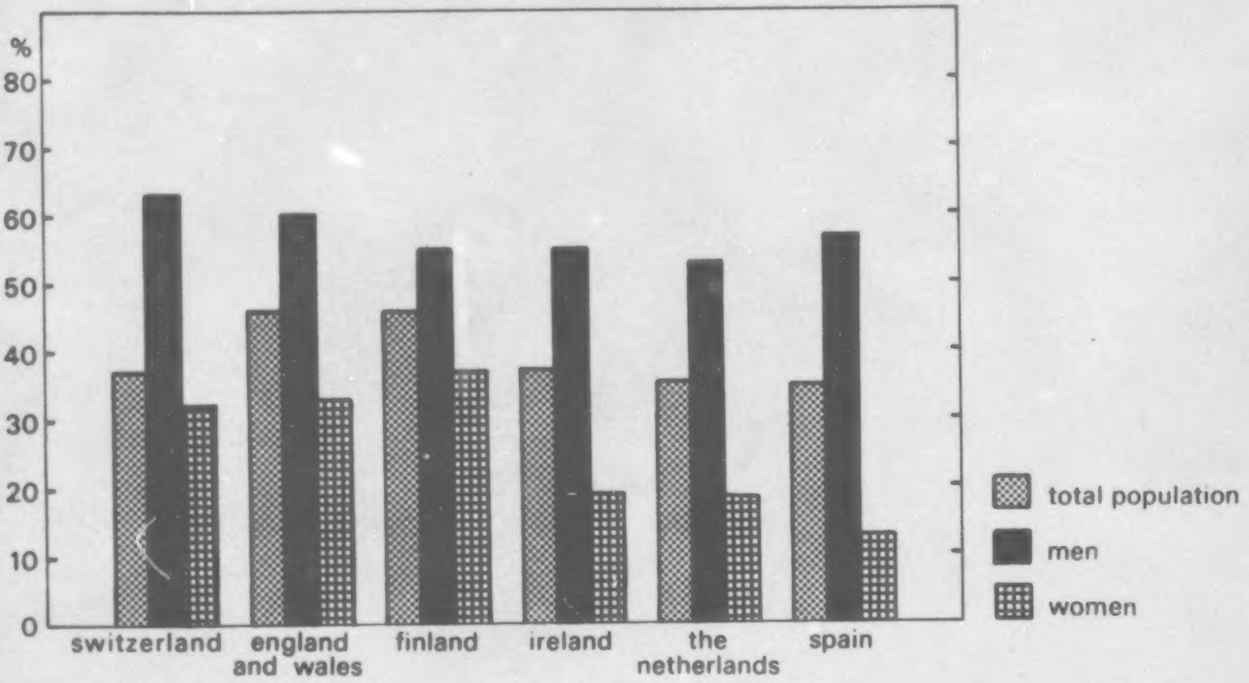
ACTIVITY RATE 1970

SPAIN	34,9
THE NETHERLANDS	35,6
IRELAND	37,6
GREECE	38,6
BELGIUM	39,9
FRANCE	41,1
AUSTRIA	41,6
SWEDEN	42,3
FED.REP.GERMANY	43,4
FINLAND	46,0
ENGLAND + WALES	46,7
SWITZERLAND	47,9

DEPENDENCY RATIO 1970		ACTIVITY RATE 1970	
IRELAND	103,4	SPAIN	34,9
THE NETHERLANDS	84,8	THE NETHERLANDS	35,6
FRANCE	83,5	IRELAND	37,6
SPAIN	83,4	GREECE	38,6
AUSTRIA	82,2	BEGIUM	39,9
BELGIUM	79,9	FRANCE	41,1
ENGLAND + WALES	78,3	AUSTRIA	41,6
FED.REP.GERMANY	75,7	SWEDEN	42,3
FINLAND	74,8	FED.REP.GERMANY	43,4
SWITZERLAND	73,7	FINLAND	46,0
ITALY	73,3	ENGLAND + WALES	46,7
SWEDEN	70,0	SWITZERLAND	47,9

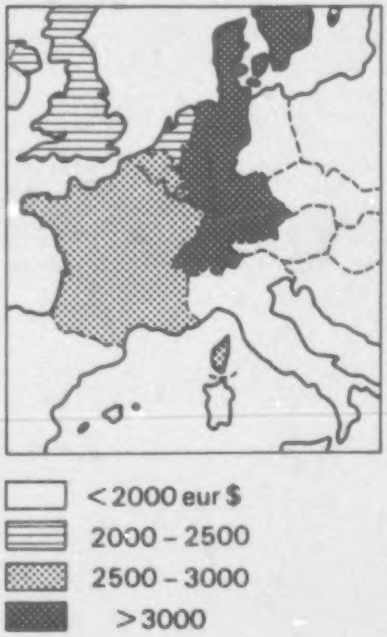


• THE ACTIVITY RATE OF THE TOTAL POPULATION IN SEVERAL EUROPEAN COUNTRIES ,ALSO SPLIT AS BETWEEN MEN AND WOMEN 1970



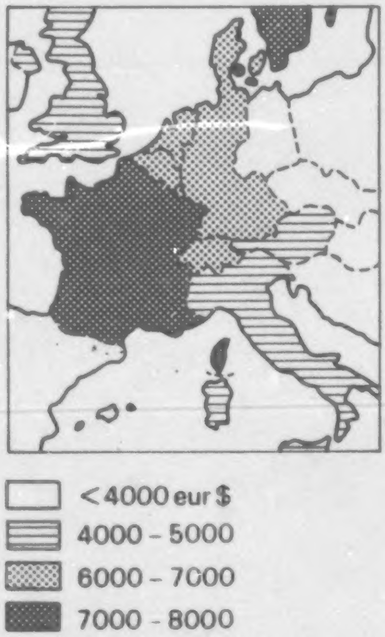
41

GNP (EUR $) BY INHABITANT IN 1970



average e.c. (6): 2560
(average japan: 1890)
(average usa: 4830)

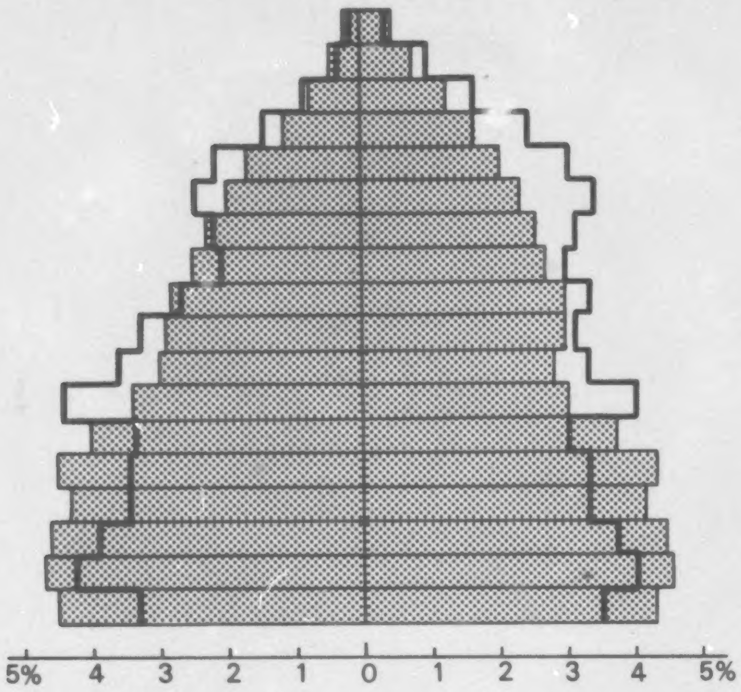
GNP (EUR $) BY MEMBER OF THE LABOUR FORCE IN 1970



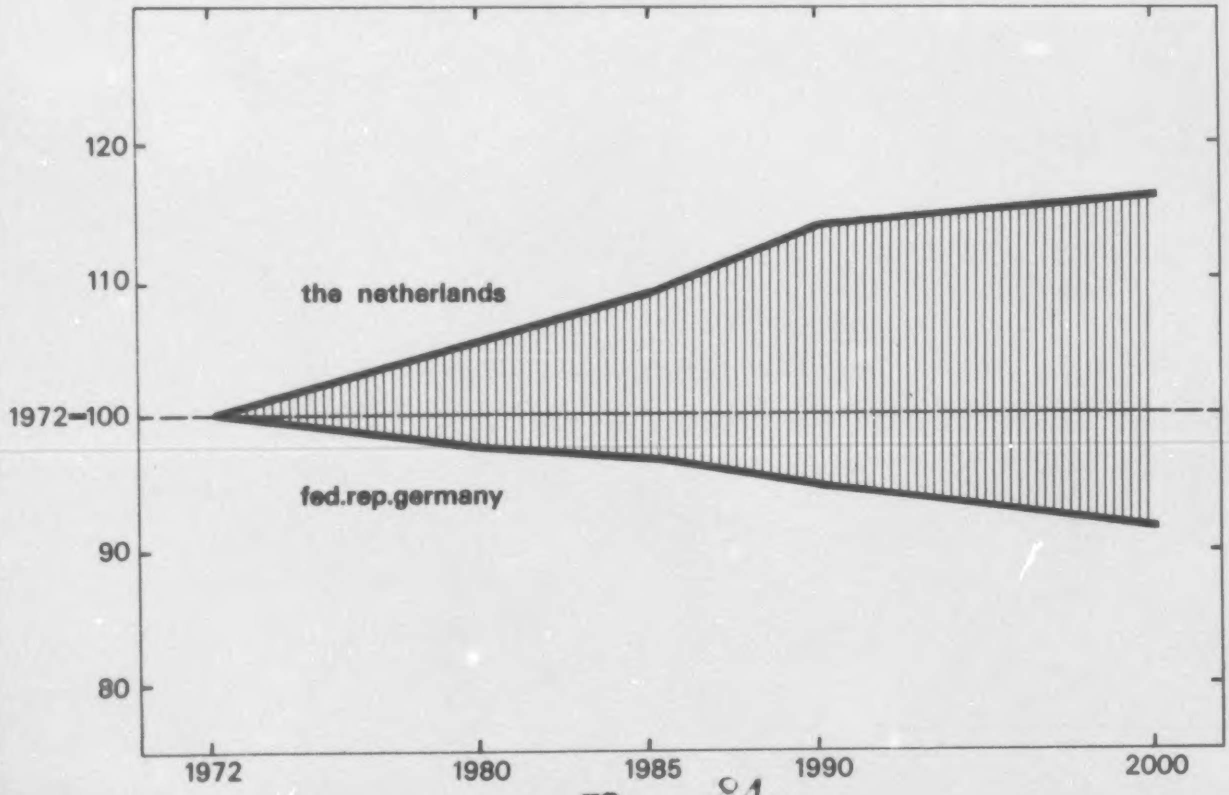
average e.c. (6) : 6300
(average japan: 3800)
(average usa: 12300)

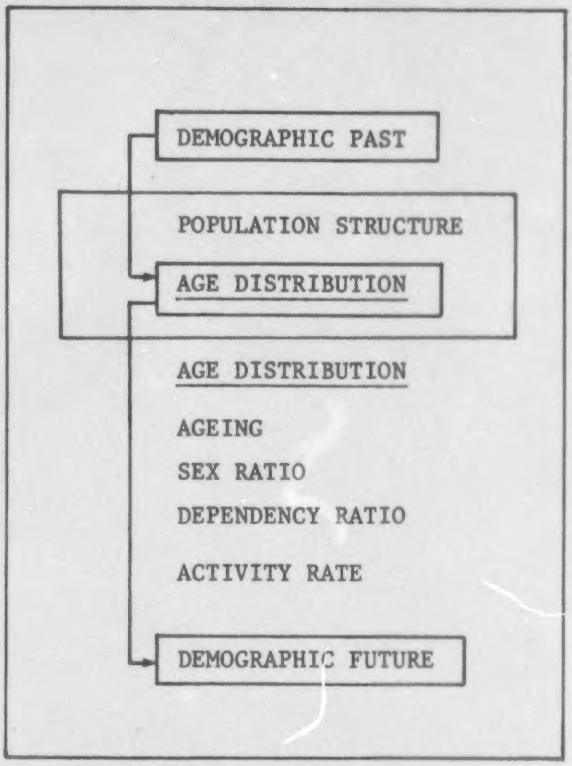
42

THE NETHERLANDS AND FED. REP. GERMANY 1972



POPULATION PROJECTIONS 1972–2000

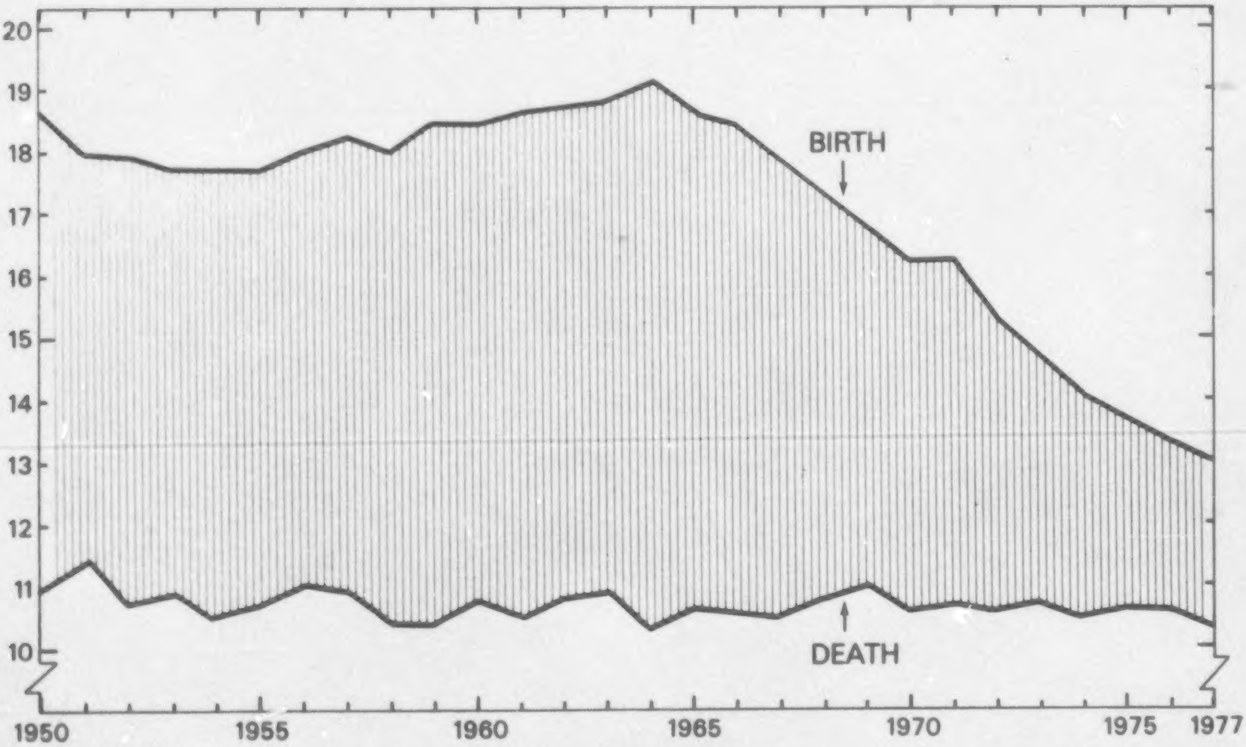



DEMOGRAPHIC PAST
POPULATION STRUCTURE
AGE DISTRIBUTION
AGE DISTRIBUTION
AGEING
SEX RATIO
DEPENDENCY RATIO
ACTIVITY RATE
DEMOGRAPHIC FUTURE

RECENT AND FUTURE DEVELOPMENTS:

- TRENDS IN BIRTH AND DEATH RATES 1950-1977
  - → RECENT BIRTH AND DEATH LEVEL
- FUTURE POPULATION SIZE

BIRTH AND DEATH RATE OF WESTERN EUROPE, 1950 – 1979 (‰)



CRUDE BIRTH RATE =

$$\frac{\text{NUMBER OF BIRTHS}}{\text{TOTAL POPULATION (YEARLY AVERAGE)}} \times 1000 \quad \text{IN A GIVEN YEAR}$$

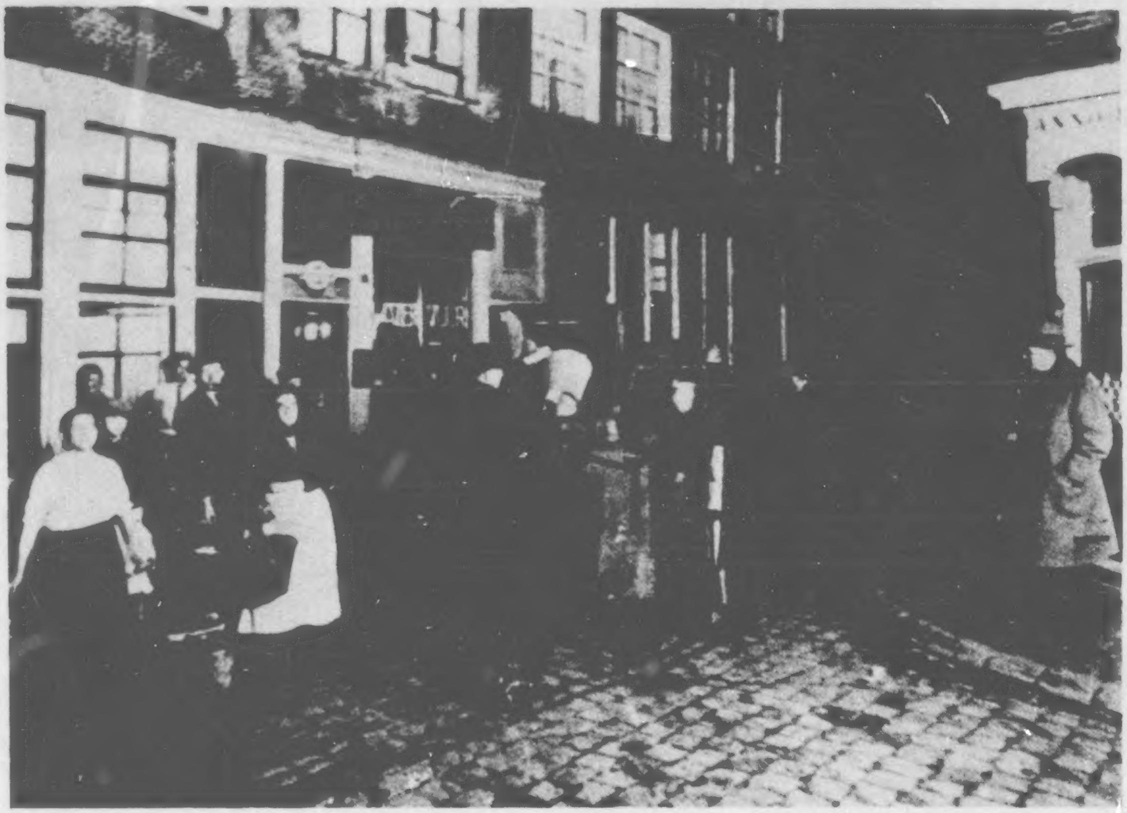
CRUDE DEATH RATE =

$$\frac{\text{NUMBER OF DEATHS}}{\text{TOTAL POPULATION (YEARLY AVERAGE)}} \times 1000 \quad \text{IN A GIVEN YEAR}$$

GROSS FIGURES → ROUGH INDEX, REFINING BY INTRODUCTION OF AGE STRUCTURE

AGE-SPECIFIC DEATH RATES FOR SELECTED AGES AND AGE BANDS OF MEN AND WOMEN IN THE NETHERLANDS, 1975

	MEN	WOMEN	
0	12.0	9.1	
1	1.6	0.8	
2 - 4	0.7	0.5	
10 - 14	0.4	0.2	minimum
40 - 44	2.3	1.6	
55 - 59	13.0	5.7	men:above inf.mort.rate
60 - 64	21.2	9.3	women:above inf.mort.rate
85 -	221.6	185.6	
AVERAGE	9.3	7.3	M+W: 8.3



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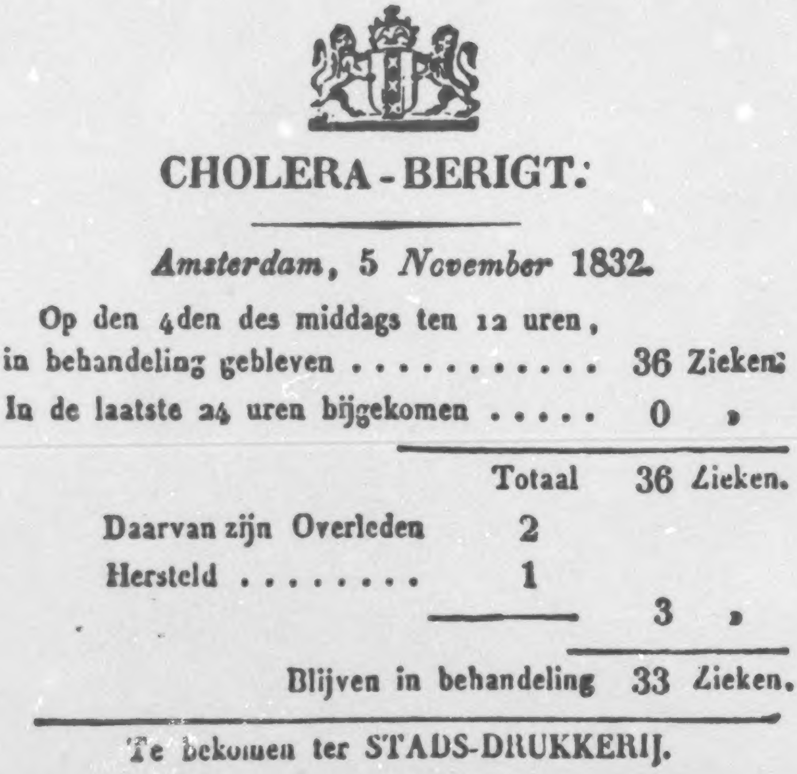


CHOLERA-BERIGT.

Amsterdam, 5 *November* 1832.

Op den 4den des middags ten 12 uren, in behandeling gebleven		36	Zieken.
In de laatste 24 uren bijgekomen		0	»
Totaal		36	Zieken.
Daarvan zijn Overleden	2		
Hersteld	1		
		3	»
Blijven in behandeling		33	Zieken.

Te bekomen ter STADS-DRUKKERIJ.

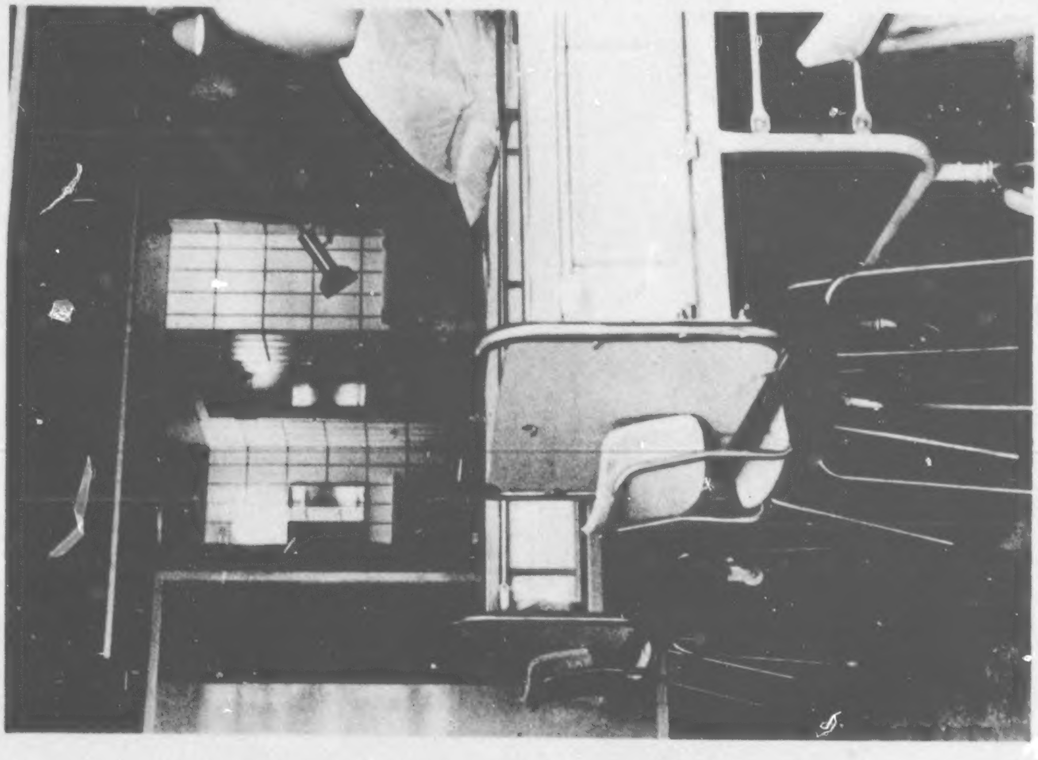
82 88

6

Operating-room, Royal Dutch Eye-hospital, Utrecht, 1899

7

Compartment of the surgical clinic, Universital Hospital, Utrecht, 1966.



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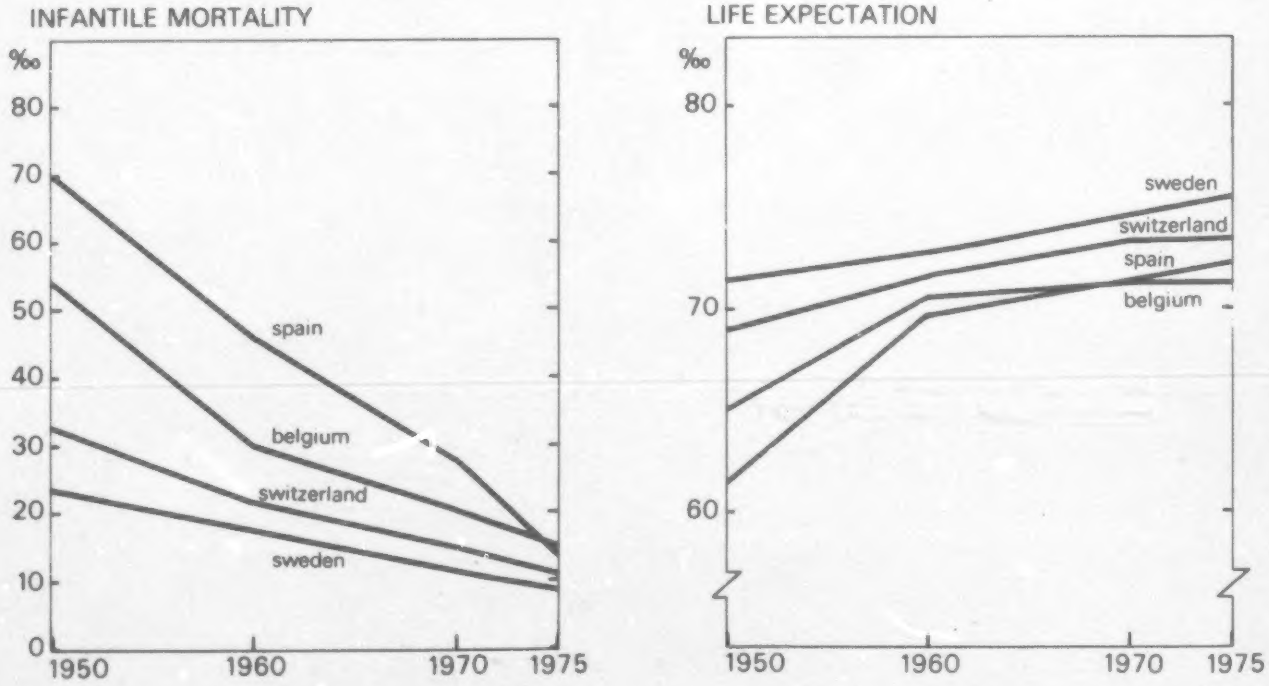
LIFE EXPECTATION OF A CHILD AGED LESS THAN ONE YEAR :

- AVERAGE LENGTH OF LIFE FOR CHILDREN AGED LESS THAN ONE YEAR.

INFANTILE MORTALITY :

- NUMBER OF DEATHS AMONG CHILDREN AGED LESS THAN ONE YEAR PER 1000 BIRTHS, IN A GIVEN CALENDAR YEAR.

INFANTILE MORTALITY AND LIFE EXPECTATION, 1950 – 1975, IN BELGIUM, SPAIN, SWEDEN AND SWITZERLAND



INFANTILE MORTALITY

LIFE EXPECTATION

LIFE EXPECTATION, THE NETHERLANDS

	MEN		WOMEN	
	1951/55	1971/75	1951/55	1971/75
50 YEARS	25.8	24.9	27.4	29.8

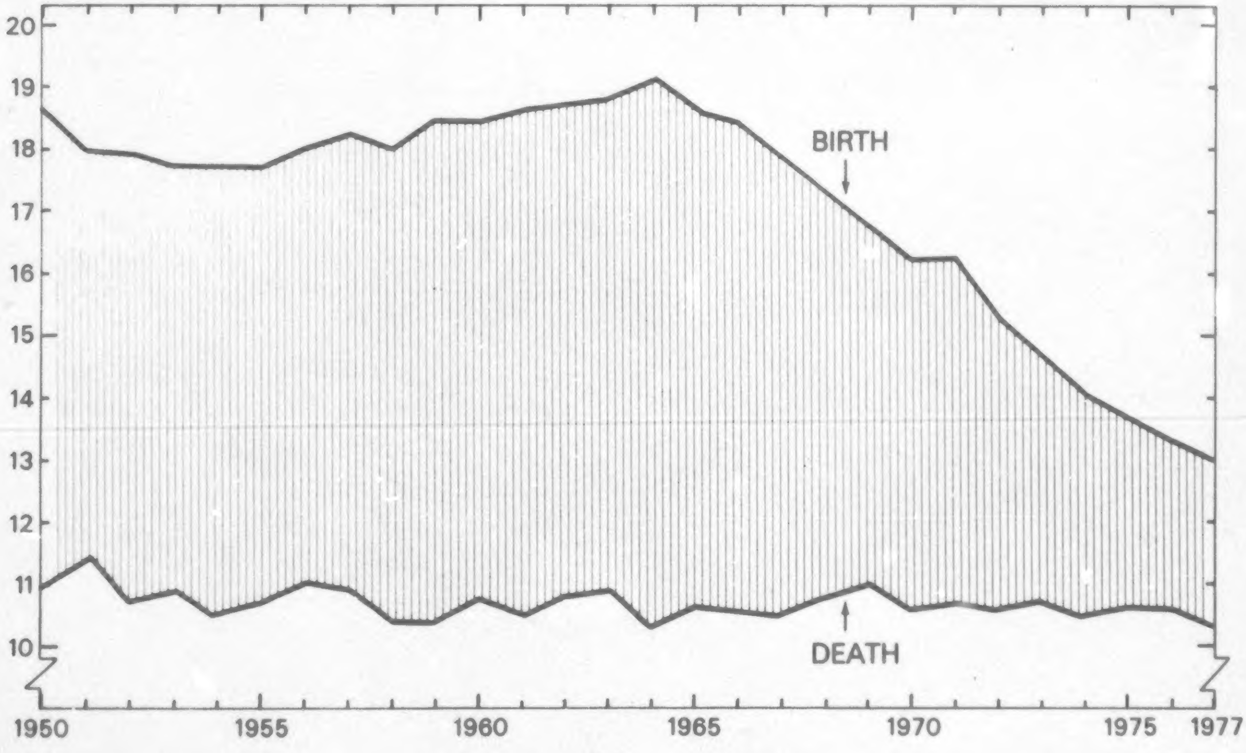
CRUDE BIRTH RATE DETERMINED BY :

- NUMBER OF BIRTHS AMONG WOMEN AGED 15-49 YEARS (FERTILITY)
- % OF WOMEN AGED 15-49 YEARS
- % OF MARRIED WOMEN AGED 15-49 YEARS

INFLUENCE POPULATION STRUCTURE ON BIRTH RATE

YEAR Y	AREA A	AREA B
NUMBER OF INHABITANTS	10 MILLION	10 MILLION
NUMBER OF WOMEN AGED 15 - 49 YEARS	3 MILLION	2 MILLION
FERTILITY RATE	100 CHILDREN/ 1000 WOMEN	100 CHILDREN/ 1000 WOMEN
NUMBER OF BIRTHS	300.000 CHILDREN	200.000 CHILDREN
BIRTH RATE	30	20

BIRTH AND DEATH RATE OF WESTERN EUROPE, 1950 – 1979 (‰)



INCREASE OF BIRTH RATE 1954-1964
BY MARRYING AT A YOUNGER AGE;

WESTERN EUROPEAN MARRIAGE PATTERN
GRADUALLY DECLINES

AFTER 1964 → DECREASE BIRTH RATE:

- DECREASE AGE OF MARRIAGE COMES TO AN END
- DECREASE OF FERTILITY (FOUR IN A FAMILY)

DECREASE IN FERTILITY, BECAUSE OF:

- BETTER CONTRACEPTIVES
- GENERAL APPLIANCE OF BIRTH CONTROL TECHNIQUES
- EMANCIPATION OF WOMEN
- CHANGED PATTERN OF SPENDING

TOTAL FERTILITY RATE:

SUM OF AGE-SPECIFIC FERTILITY RATES OF WOMEN AGED 15 - 49 YEARS (IN A GIVEN CALENDAR YEAR)

T.F.R. : GENUINE INDEX OF FERTILITY

TOTAL FERTILITY RATES BY COUNTRY

COUNTRIES	TOTAL FERTILITY RATES		
	1964	1977 (est.)	DECREASE (%)
FED.REP.GERMANY	2.55	1.41	45
LUXEMBURG	2.38	1.50	37
SWITZERLAND	2.68	1.52	43
NETHERLANDS	3.17	1.59	50
AUSTRIA	2.77	1.63	41
SWEDEN	2.47	1.64	34
DENMARK	2.60	1.66	36
FINLAND	2.40	1.67	30
UNITED KINGDOM	2.90	1.68	42
BELGIUM	2.71	1.75	35
NORWAY	2.96	1.77	40
FRANCE	2.90	1.87	36
ITALY	2.62	1.93	26
ICELAND	3.71	2.29	38
GREECE	2.32	2.35	-
PORTUGAL	3.14	2.45	22
SPAIN	3.00	2.60	13
IRELAND	4.08	3.50	14

FERTILITY →
STATIONARY POPULATION BALANCES
REPRODUCTION RATE (T.F.R.: 2.11)

FERTILITY AND BIRTH SURPLUS BY COUNTRY IN 1977

1977 (est.)

COUNTRIES	TOTAL FERTILITY RATE	BIRTH RATE	DEATH RATE	BIRTH SURPLUS
FED.REP.GERMANY	1.41	9.4	11.4	-2.0
LUXEMBURG	1.50	11.4	11.5	-0.1
SWITZERLAND	1.52	11.5	8.7	2.8
NETHERLANDS	1.59	12.5	7.9	4.6
AUSTRIA	1.63	11.3	12.2	-0.9
SWEDEN	1.64	11.6	10.7	0.9
DENMARK	1.66	12.2	9.9	2.3
FINLAND	1.67	13.9	9.4	4.5
UNITED KINGDOM	1.68	11.8	11.7	0.1
BELGIUM	1.75	12.5	11.5	1.0
NORWAY	1.77	12.7	9.8	2.9
FRANCE	1.87	14.0	10.1	3.9
ITALY	1.93	13.2	9.3	3.9
ICELAND	2.29	17.9	6.5	10.4
GREECE	2.35	15.4	8.9	6.5
PORTUGAL	2.45	18.4	9.6	8.8
SPAIN	2.60	17.9	7.9	10.0
IRELAND	3.50	21.2	10.6	10.6

PROGNOSES OF POPULATION SIZE (IN MILLIONS)

	WESTERN EUROPEAN COUNTRIES (EXCL. SOUTH. EUR. COUNTRIES)		SOUTHERN EUROPEAN COUNTRIES (INCL. GREECE, YUGO-SLAVIA)	
	T.F.R. 2.0	T.F.R. 1.5	T.F.R. 2.0	T.F.R. 1.5
1970	228.4	228.4	127.7	127.7
1990	246.5	236.2	143.3	139.6
2000	253.8	234.1	150.0	141.2
2030	263.0	200.1	156.6	125.5

PROGNOSES OF POPULATION SIZE OF THE FED.REP.GERMANY, 1975 - 2070, BASED ON THE FERTILITY LEVEL OF 1977

	TOTAL POP.	1975=100	AGE BANDS (%)		
			< 16	16-64	65 AND >
1975	57.937	100	23.0	61.7	15.2
2000	52.213	90	16.8	67.3	15.8
2020	44.160	76	13.9	67.1	19.0
2030	39.444	68	13.7	62.9	23.4
2040	34.384	59	13.1	61.7	25.2
2050	29.504	51	13.4	63.6	22.9
2060	25.437	44	13.4	62.2	24.4
2070	22.003	38	13.3	62.6	24.1

PROGNOSES OF FUTURE POPULATION SIZE IN THE NETHERLANDS, 1975-2050

	1.9 CHILDREN/WOMAN		1.5 CHILDREN/WOMAN	
	TOTAL POP. (000)	1975=100	TOTAL POP. (000)	1975=100
1975	13.599	100	13.599	100
2000	15.221	112	14.284	105
2010	15.359	113	13.906	102
2020	15.407	113	13.256	97
2050	14.014	103	9.661	71

DEPENDENCY RATIO ACCORDING TO ALTERNATIVE A AND B

	AGE BANDS (%)						DEPENDENCY RATIO	
	< 20 YEAR		20 - 64		65 AND >			
	A	B	A	B	A	B	A	B
1975	34.2	34.2	55.1	55.1	10.7	10.7	81.5	81.5
2000	26.9	22.5	60.3	63.9	12.8	13.6	65.9	56.6
2020	23.7	18.3	59.2	61.9	17.0	19.8	68.8	61.6

POPULATION STRUCTURE IN THE NETHERLANDS IN AGE BANDS ACCORDING TO ALTERNATIVE B

	1975 (000)	2000 (000)	2020 (000)
TOTAL	13.599	14.284	13.256
20 YEARS	4.646	3.211	2.437
20 - 39	3.467	4.249	3.169
40 - 64	4.026	4.874	5.028
65 and	1.460	1.950	2.622

DECELERATION OF POPULATION GROWTH IN WESTERN EUROPE :

- LESS PRESSURE ON THE ENVIRONMENT
- DECREASE OF DEPENDENCY RATIO
- AGEING DEMANDS ADAPTATION OF AMENITIES AND SOCIAL WELFARE PROVISION
- CHANGE IN MENTALITY

CLASSIFICATION OF THE POPULATION ACCORDING TO FAMILY SIZE IN THE FEDERAL REPUBLIC GERMANY :

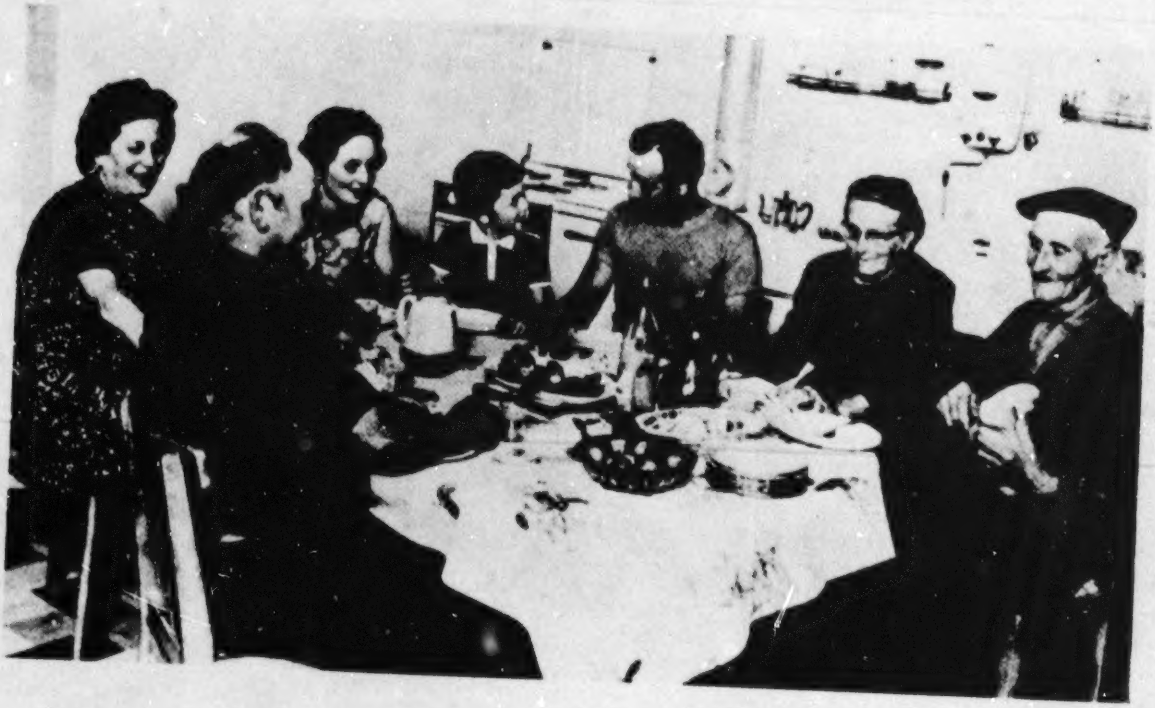
NUMBER OF CHILDREN PER FAMILY IN 1975 WITH REFERENCE TO THE FERTILITY LEVEL (A), NUMBER OF CHILDREN PER FAMILY NEEDED TO BRING THE FERTILITY UP TO THE REPRODUCTION LEVEL (B)

NUMBER OF CHILDREN	PERCENTAGE OF FAMILIES	
	A	B
0	24	15^x
1	31	5
2	33	35
3	10	35
4 AND >(A), 4(B)	2	10

x NOT VOLUNTARILY CHILDLESS: 10%

TO REACH A ± STATIONARY POPULATION, IS NEEDED :

- A GOVERNMENT POLICY TO INCREASE THE NUMBER OF BIRTHS (FINANCIAL INCENTIVES, SOCIAL WELFARE)



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The Decline of Belgian Fertility, 1800-1970
La démographie de la France bilan et perspectives
Policies of population redistribution

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